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THE INTERNATIONAL JOURNAL OF ACCOUNTING

EDUCATION AND RESEARCH

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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V. K. Zimmerman, *Editor*
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The Relationship between Firm Attributes and Early Adoption of the Foreign Currency Translation Standard, SFAS No. 52: An Empirical Investigation

BETTY BROWN*

In December 1981, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 52 (SFAS No. 52)¹ in response to the harsh criticism of its predecessor, SFAS No. 8,² promulgated in 1975. SFAS No. 8 required companies to use the temporal translation method whereby cash and all accounts fixed in terms of monetary amounts, as well as nonmonetary assets carried at current costs, were translated at the current rate. All other assets and liabilities were translated at the respective historical rates in effect at the time the assets were acquired or the liabilities were incurred. Revenue and expenses derived from balance sheet amounts were translated at the same rate as the related balance sheet items. Other revenue and expense accounts were translated at the average rate for the period. The translation gains and losses resulting from this translation method — often large — were required to be closed to net income.

SFAS No. 52, on the other hand, adopted the functional currency translation method. The functional currency is defined as the currency in which the foreign subsidiary realizes most of its cash

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¹ Financial Accounting Standards Board, *Statement of Financial Accounting Standards Number 52, "Foreign Currency Translation"* (Stamford, Conn.: FASB, 1981).

² Financial Accounting Standards Board, *Statement of Financial Accounting Standards Number 8, "Accounting for the Translation of Foreign Currency Translation and Foreign Currency Financial Statements"* (Stamford, Conn.: FASB, 1975).

flows. If the foreign subsidiary is "self-contained" within the foreign boundaries (frequently the case), the functional currency is the local currency of the foreign subsidiary. For such self-contained foreign subsidiaries, SFAS No. 52 requires that all assets and liabilities be translated at the current exchange rate. In comparison with the former temporal method, this new translation method generally results in only minor gains and losses that must be disclosed directly within stockholders' equity; that is, translation adjustments of self-contained foreign subsidiaries bypass the income statement.

Since SFAS No. 52 became mandatory only for fiscal years beginning after December 15, 1982, calendar year companies had the option of using either standard during 1981 and 1982. This relatively long transition period provided an opportunity to investigate whether financial characteristics of firms are related to the selection of an accounting method when options are available.

This study is intended to provide information of some measurable financial characteristics (attributes) of companies that changed from SFAS No. 8 to SFAS No. 52 before the mandatory date. The purpose is to determine whether specific attributes are related to the choice of foreign currency translation standards within a given time period. If differences exist between the change and non-change companies, the choice in translation methods may have been motivated by the desire to reflect certain financial characteristics of attributes, not by an interest in disclosing the financial position and results of operations according to the translation method presently deemed preferable.

Seven measurable attributes of two groups of companies were compared. One group voluntarily adopted SFAS No. 52 on December 31, 1981 ("adopt-early group" or "change group"), while the other group opted to continue reporting under the requirements of SFAS No. 8 ("non-change group"). The attributes compared are (1) the debt-to-equity ratio as of December 31, 1981; (2) foreign currency translation gains and losses for 1980; (3) foreign currency translation gains and losses for 1981; (4) translation gains and losses as a percent of net income for 1981; (5) the 1981 ratio of foreign revenues to total revenues; (6) ratio of foreign identifiable assets to total identifiable assets as of December 31, 1981; and (7) 1981 primary earnings per share.

JUSTIFICATION FOR THE SELECTION OF ATTRIBUTES

Debt to Equity Ratio as of December 31, 1981

Since the translation method used could affect the restrictiveness of bond covenants, the proportion of debt financing might be a factor in the decision to adopt SFAS No. 52 early. The numerator,

debt, in the debt-to-equity ratio is translated at the current rate under both methods. The denominator differs under the two translation methods, however, even though the translation differences under both methods ultimately appear in owners's equity. Equity differs under the two methods because the amount, and at times even the sign (i.e., gain or loss), of the translation difference is not the same under the temporal and the current rate translation methods.

Foreign Currency Translation Gains and Losses for 1980

The decision to change standards may have been affected by 1980 translation gains and losses since 1981 foreign currency translation gains and losses were not completely determinable until the end of 1981. Although the change would not have affected 1980 reported profits, these amounts were available when the decision was made, whereas the 1981 amounts were not complete.

Foreign Currency Translation Gains and Losses for 1981

One of the basic assumptions in economics is that man is rational and that when given choices, he will select the alternative which offers him the greatest benefit. Lewellen and Huntsman, for example, found that management compensation is significantly related to reported net profits.³ It therefore follows that the rational manager can be expected to select the accounting principle that results in the highest reported net income if management compensation is significantly related to reported net income.

Griffin analyzed differences in various exchange gains and losses to income ratios.⁴ His sample included not only the FASB respondents to the May 1978 invitation to comment on SFAS No. 8 but also an independent sample of multinational companies. The test results indicate that translation gains and losses have a relatively minor effect on reported income, but FASB respondents experienced greater volatility in pretax earnings.

In a follow-up to his 1982 study, Griffin found that SFAS No. 52 respondents appear to be relatively larger in size and less profitable than other multinational companies. He expressed the view that "... corporate managers act in a self-interested manner preferring accounting proposals that enhance rather than diminish the utility of their wealth."⁵

³ Wilbur G. Lewellen and B. Huntsman, "Managerial Pay and Corporate Performance," *American Economic Review* (September 1970), 710-20.

⁴ Paul A. Griffin, "Foreign Exchange Gains and Losses: Impact on Reported Earnings," *ABACUS* (June 1982), 50-69.

⁵ Paul A. Griffin, "Management's Preferences for FASB Statement No. 52: Predictive Ability Results," *ABACUS* (December 1983), 130-38.

If managers are assumed to be rational and acting in their self-interest, then 1981 foreign currency translation gains and losses might have affected the decision to adopt SFAS No. 52 because of the effect on net income and management compensation. The amount of excludable translation gain or loss is disclosed in the financial statements since early adoptees are required to disclose the pro forma effect on income. SFAS No. 8 requires companies to disclose foreign currency translation gains and losses in the financial footnotes. This information is available on the Securities and Exchange Commission (SEC) form 10-K.

The problems of defining exposure and determining risk factors related to compliance with the provisions of SFAS No. 8 have been addressed in studies by Dietman, Feskoe, Choi, and Smith.⁶ Studies by Evans, Folks, and Jilling; Mathur and Loy; Cooper, Fraser, and Richards; and Stanley and Block have indicated that translation gains and losses affect corporate management practices.⁷ They believe that the inclusion of translation gains and losses in net income might have led to dysfunctional behavior (i.e., excessive hedging) on the part of corporate managers.

The ratio of foreign monetary assets to foreign monetary liabilities would have provided the ideal measure of differences in accounting exposure and risk factors for the two groups if the foreign subsidiary's net monetary position were perceived to be at risk of devaluation. Information of the foreign monetary position was not publicly available, however.

Translation Gains and Losses as a Percentage of Net Income for 1981

Direct comparisons of the actual dollar amounts are confounded by differences in firm size. This problem is partially controlled by standardizing foreign currency translation gains and losses as a percentage of net income. Net income for the adopt-early group

⁶ Gerald J. Dietman, "Evaluating Multinational Performance Under FAS 8," *Management Accounting* (May 1980), 49-55; Gaffney Feskoe, "Reducing Currency Risks in a Volatile Foreign Exchange Market," *Management Accounting* (September 1980), 19-24; Frederick D. S. Choi, "Foreign Inflation and Management Decisions," *Management Accounting* (June 1977), 21-27; and Alan F. Smith, "Temporal Method: Temporary Mode," *Management Accounting* (February 1987), 21-26.

⁷ Thomas G. Evans, William R. Folks, Jr., and Michael Jilling, *The Impact of Statement of Financial Accounting Standards No. 8 on the Foreign Exchange Risk Management Practices of American Multinationals: An Economic Impact Study* (Stamford, Conn.: FASB, 1978); Ike Mathur and David Loy, "Foreign Currency Translation: Survey of Corporate Treasurers," *Management Accounting* (September 1981), 33-38; Kerry Cooper, Donald R. Fraser, and R. Malcolm Richards, "Impact of SFAS 8 on Financial Management Practices," *Financial Executive* (June 1978), 26-31; and Marjorie T. Stanley and Stanley B. Block, "Accounting and Economic Aspects of SFAS 8," *International Journal of Accounting* (Spring 1979), 135-55.

was adjusted for the currency translation losses excludable under the current rate method of SFAS No. 52 for purposes of comparability. This information was taken from the financial statement footnotes.

A recent study by Coopers & Lybrand surveyed 392 of the *Fortune* 500 industrial companies and the *Fortune* 50 largest non-industrial companies to determine why they did or did not adopt SFAS No. 52 before the mandatory date and, if they did, what effect it had on corporate earnings.⁸ Survey results indicate that 40 percent of the companies adopted SFAS No. 52 for the fiscal year ended December 31, 1981. Industrial companies electing an early compliance had an average increase in net income of 11 percent over what it would have been in the current year if the company had not adopted SFAS No. 52 early. On the other hand, nonindustrial companies showed only a 2 percent increase in net income. This information was readily available since companies electing to adopt SFAS No. 52 for fiscal years ended on or before March 31, 1982, were required to disclose the pro forma effect on income of changing standards. Corresponding pro forma earnings, however, were not required to be disclosed by companies deciding against an early adoption.

The most common reason given for not complying early was the cost of sudden implementation. Since the standard was not approved until December 1981, the time for implementation was short; therefore, this reason appears credible on the surface. It should be mentioned, however, that the change from the multiple exchange rate method of SFAS No. 8 to the single exchange rate method of SFAS No. 52 would be relatively easy.

Ratio of 1981 Foreign Revenues and Foreign Identifiable Assets as of December 31, 1981, to the Corresponding Consolidated Totals

Companies were compared according to the proportion of foreign revenue to total revenue and foreign assets to total assets, thus controlling for differences in the proportion of foreign operations to total operations (i.e., foreign operations may be more material to some companies than to other companies). Thus, the proportion of foreign operations may logically affect the amount of attention that management pays to foreign currency translation standards.

1981 Primary Earnings Per Share

The difference in primary earnings per share (PEPS) between the two groups was also compared. This comparison was made to determine whether the reported earnings of the group that adopted

⁸ Coopers & Lybrand, *Foreign Currency Translation: An Implementation Study* (New York: Coopers & Lybrand, 1982).

SFAS No. 52 early were significantly different from the reported earnings of the group that did not adopt early. PEPS was selected rather than fully diluted earnings per share (FDEPS) because all companies must report PEPS, whereas fewer than half of all companies are required to report FDEPS.

DATA SOURCES

Most *Fortune* 500 industrial corporations have multinational operations; therefore, all of those firms which met the following conditions were selected for the study. Test companies must (1) have a fiscal year ending December 31; (2) be listed on the Standard and Poor's Industrial COMPUSTAT tape; (3) have SEC 10-Ks listed on microfiche; (4) have foreign subsidiaries that designate the local currency as the functional currency and that are not located in highly inflationary economies; and (5) report segmental geographical data on their financial statements.

All companies registered with the Securities and Exchange Commission are required to file annually a 10-K report which includes their financial statements. SFAS No. 8 required companies to disclose foreign currency translation gains and losses in the notes of their financial statements; therefore, SEC reports were used to determine the amounts of foreign currency translation gains and losses for 1980 and 1981 and total foreign revenues and identifiable assets for 1981. Also, companies electing an early compliance with SFAS No. 52 were required to disclose the impact of the early adoption on income. The total translation gain or loss for the early adoptees would have been the sum of the pro forma amount required to be disclosed under SFAS No. 52 and the actual translation gains and losses included in net income. These gains and losses resulted from foreign operations in highly inflationary economies or operations with the U.S. dollar as the functional currency.

Not included in this study were companies whose major foreign subsidiaries were operating in highly inflationary economies or had determined the U.S. dollar to be the functional currency. These companies were eliminated since the results under SFAS No. 52 were the same as under SFAS No. 8 (i.e., these companies changed only the name of the translation method without any change in the results from operations).

Finally, only companies reporting geographical segmental data for the fiscal year ended December 31, 1981, were included in the study. This restriction was necessary because some of the

financial attributes tested require information concerning revenues, profits or losses, and identifiable assets by geographical segments.

December 31, 1981, was selected because 1981 was the year large foreign currency translation losses occurred for most companies, with significant impacts on income. The final number of usable enterprises included 83 companies that elected to adopt SFAS No. 52 at December 31, 1981, and 103 companies that did not adopt on that date. The companies included in this inquiry are identified separately by "adopt-early group" and "non-change group" in the Appendix.

STATISTICAL TESTS

The null hypothesis tested was the following:

H₀: There are no significant differences (in the debt-to-equity ratio as of December 31, 1981; the amount of foreign currency translation gains and losses for 1980 and 1981; the translation gains and losses as a percent of net income for 1981; the 1981 ratio of foreign revenues to total revenues; the ratio of foreign assets to total assets as of December 31, 1981; and 1981 primary earnings per share) between companies that elected to comply with SFAS No. 52 early and those companies that did not elect an early compliance.

Each attribute was compared between the two groups using the general t-test which can be stated mathematically as:

$$t = (\bar{x}_1 - \bar{x}_2) / (s_1^2/N_1 + s_2^2/N_2)^{1/2} \quad (1)$$

where

\bar{x} is the mean and

s^2 is the variance for the variable of interest.

A series of t-tests on different variables within the same observations often leads to a confusion of alpha risks because each alpha risk is not independent of the other. The alpha risk, called the level of significance, is the probability of rejecting the null hypothesis when, in fact, it is true. There is a high probability that tests on positively associated variables will lead to the same conclusion.

Correlations between variables will be tested by the correlation coefficient, r , which is mathematically stated as:

$$r_{ik} = \frac{\sum_j (x_{ij} - \bar{x}_i)(x_{kj} - \bar{x}_k)}{[\sum_j (x_{ij} - \bar{x}_i)^2 \sum_j (x_{kj} - \bar{x}_k)^2]^{1/2}} \quad (2)$$

or simply,

$$r_{ik} = \text{cov}_{ik} / s_i s_k$$

where

s_i and s_k are the standard deviations for each variable.

A basic assumption of the t-test is that both groups come from normally distributed populations. If the normality assumption is not valid, the nonparametric version of the t-test, the Wilcoxon Rank Sum test, might be more appropriate to test for differences between the two groups. The Wilcoxon Rank Sum test is stated mathematically as:

$$W = \sum_{j=1}^n R_j \quad (3)$$

where

R_j = the rank of the observations when ordered from least to greatest, and

W = the sum of the ranks.

The Hotelling T^2 test was used to analyze simultaneously differences between all the variables of interest in the two groups. Hotelling's T^2 is a test to determine whether the difference in the mean vectors of the two groups is significant. The test statistic can be mathematically stated as:

$$T^2 = (\bar{X}_1 - \bar{X}_2)' S^{-1} (\bar{X}_1 - \bar{X}_2) / (1/N_1 + 1/N_2) \quad (4)$$

where:

\bar{X}_1 is the sample mean vector of the variables in one group.

\bar{X}_2 is the sample mean vector of the variables in the other group.

S is a square matrix representing the pooled within-groups covariance matrix for the two groups.

The F distribution will be used to evaluate the significance of T^2 because Hotelling's T^2 can be transformed into an F statistic:

$$F = \frac{T^2(N_1 + N_2 - v - 1)}{v(N_1 + N_2 - 2)} \quad (5)$$

where v is the number of variables in the analysis.

RESULTS

Univariate t-test on Attributes

Test results are summarized in Exhibit 1. The most obvious difference between the change and non-change companies is in the dollar amount of foreign currency translation gains and losses for the fiscal year ending December 31, 1981. The mean difference between the two groups was highly significant, with a p-value of

Exhibit 1. Univariate T-Test on Attributes

| nA = 83 | | | | |
|----------|----------|---------|-------|---------|
| nN = 103 | | | | |
| Variable | A-mean | N-mean | T obs | p-value |
| FC80 | -0.6397 | 2.5349 | -1.17 | 0.2440 |
| FC81 | -13.7794 | 12.3262 | -2.88 | 0.0045 |
| PEPS | 1.8171 | 2.8157 | -1.96 | 0.0514 |
| DER | 1.0503 | 1.2331 | -1.87 | 0.0637 |
| RR | 0.2614 | 0.2496 | 0.53 | 0.5942 |
| AR | 0.3154 | 0.2870 | 1.19 | 0.2369 |
| FCR | -0.4055 | 0.0774 | -2.26 | 0.0250 |

FC80 = Foreign currency translation gains and losses for the fiscal year ended December 31, 1980

FC81 = Foreign currency translation gains and losses for the fiscal year ended December 31, 1981

PEPS = 1981 primary earnings per share

DER = Debt to equity ratio, December 31, 1981

RR = 1981 foreign revenues to total revenues

AR = Foreign assets to total assets, December 31, 1981

FCR = Foreign currency translation gain and loss to net income ratio

nA = The number of companies that adopted SFAS No. 52 early

nN = The number of companies that did not adopt SFAS No. 52 early

0.0045. The companies that adopted SFAS No. 52 as of December 31, 1981, had an average foreign currency translation loss of \$13.7794 million. In contrast, the companies that did not adopt SFAS No. 52 early had an average foreign currency translation gain of \$12.3262 million. Compliance with the requirements of SFAS No. 52 resulted in an average increase in net earnings for companies that adopted early. On the other hand, compliance with SFAS No. 52 would have resulted in a decrease in net earnings for companies that did not elect an early adoption.

Furthermore, virtually all companies in the adopt-early group had translation losses that could be excluded from reported earnings and were therefore able to increase net earnings for December 31, 1981, by electing an early compliance with the requirements of SFAS No. 52.

A visual inspection of the data showed two extremes — one with a gain of \$710 million and the other with a \$309 million gain. When these two observations were eliminated from the groups, the mean translation gain for the non-change group fell from 12.3262 to 2.4812 (Exhibits 1 and 2). The observed value of *t* for the variable changed from -2.88 to -4.54, however, and the level of significance was even higher, at 0.0001, because the standard deviation decreased from 80.3125 to 27.0845.

Exhibit 2. Univariate T-Tests on Reduced Groups

| nA = 83 | | | | |
|----------|----------|---------|---------|---------|
| nN = 101 | | | | |
| Variable | A-mean | N-mean | T obs | p-value |
| FC80 | -0.6397 | -0.2861 | -0.2651 | 0.7913 |
| FC81 | -13.7794 | 2.4812 | -4.5395 | 0.0001 |
| PEPS | 1.8171 | 2.8778 | -2.0550 | 0.0415 |
| DER | 1.0503 | 1.2215 | -1.8383 | 0.0678 |
| RR | 0.2614 | 0.2424 | 0.8887 | 0.3754 |
| AR | 0.3154 | 0.2811 | 1.4373 | 0.1525 |
| FCR | -0.4055 | 0.0819 | -2.1567 | 0.0329 |

These results are consistent with the results of the Coopers & Lybrand study which shows an average increase in net income of 11 percent for companies that elected an early compliance with SFAS No. 52. This leads to the logical conclusion that companies are more willing to change accounting standards if the change results in increased reported profits.

Other attributes indicating significant differences are the 1981 primary earnings per share, the 1981 ratio of foreign currency translation gains and losses to net income, and the debt-to-equity ratio as of December 31, 1981. As presented in Exhibit 1, these attributes were different at the .0514, .0250, and .0637 levels of significance. This suggests that these attributes might also have been factors in the decision to adopt SFAS No. 52 before the mandatory date.

Primary earnings per share for the adopt-early group are significantly smaller (1.8171) than for the non-change group (2.8157), as indicated in Exhibit 1. Although foreign currency translation gains and losses are excludable from the EPS for the change group, they are not excludable from the EPS of the non-change group; therefore, the two groups are not comparable for this attribute.

The use of sensitivity analysis, a technique that asks how a result will change if the original data are changed, facilitated two "as if" comparisons on the PEPS variable. As presented in Exhibit 3, the change group had average translation losses of \$13.7794 million, which would have caused a decrease in PEPS from 1.8171 to 1.4495 per share if the group had not changed to SFAS No. 52. These amounts were computed for the adopt-early group by subtracting the translation losses disclosed in the financial footnotes from net income and dividing the result by the shares used in the PEPS computation. This "as-if" analysis caused an even greater

Exhibit 3. "As If" T-Test of PEPS (complete groups)

| | | | |
|--|--------------------|---------|---------|
| Assuming both groups complied with SFAS No. 8 | | | |
| Adopt-early mean | Non-change mean | T obs | p-value |
| 1.4495 | 2.8157 | -2.5817 | 0.0107 |
| Assuming both groups complied with SFAS No. 52 | | | |
| Adopt-early mean | Non-change mean | T obs | p-value |
| 1.8171 | 2.7772 | -1.8217 | 0.0701 |

difference between the two groups with a new *t* observed of -2.5817 and a *p*-value of 0.0107, compared with the previous *t* observed of -1.96 and *p*-value of 0.0514 (Exhibit 1).

Conversely, the assumption that both groups complied with SFAS No. 52 resulted in a lower PEPS number for the non-change group because average translation gains would be excluded from income. The hypothetical PEPS amounts for the non-change group were obtained by subtracting from net income the translation gains disclosed in the financial footnotes and dividing the result by the shares used in the PEPS computation. This analysis caused less difference in PEPS between the two groups with a *t* observed of -1.8217 and a *p*-value of 0.0701 (Exhibit 3).

Even when placed on a comparable basis, the PEPS amounts are significantly different for the two groups, assuming that a *p*-value of 0.0701 is significant. The inclusion of foreign currency translation gains and losses in net income did result in greater differences, reinforcing the earlier conclusion that translation gains and losses had opposite effects on income for the change and non-change groups of firms.

The ratio of foreign currency translation gains and losses to net income was also significantly different for the two groups. Intuitively, if the translation gains and losses are different, one would expect the ratio also to be different between the two groups. The foreign currency translation gains and losses for the adopt-early group represent a much larger proportion of net income than the translation gains and losses for the non-change group. The proportion of translation gains and losses for the non-change group is only .0774, while the proportion for the change group is a negative .4055 (Exhibit 1). Therefore, inclusion of translation gains and losses in the net income of the change group would

have had a much greater impact on net income than for the non-change group. This is further explored in comparisons of the PEPS variable.

Correlation matrices for the two groups are presented in Exhibit 4. For the adopt-early group, the correlation coefficients indicate that both the amount of 1981 foreign currency translation gains and losses and the primary earnings per share are independent of the proportion of translation gains and losses to net income (i.e., 0.0510 and 0.0022, respectively). The 1981 translation gains and losses and PEPS are also independent of the ratio of gains and losses to net income for the non-change group with r values of -0.0134 and -0.0359 , respectively (Exhibit 4). Since scatterplots of the two distributions show vertical distribution, one possible explanation for these counterintuitive (i.e., negative) results is the non-linear association of the variables. Thus, a continuancy-table-measure association may be more appropriate than correlation.

The debt-to-equity ratio for the change group was smaller than for the non-change group at the 0.0637 level of significance. The debt-to-equity ratio for both groups is greater than 1, indicating that debt capital exceeds equity capital for both groups. However, the average ratio for the change group is lower and closer to 1. That is, companies that did not adopt early had, on average, a larger proportion of debt financing than the companies that did adopt SFAS No. 52 early. This implies that the financial leverage for the non-change group was higher, because less favorable financial leverage would cause companies to rely more on equity financing and less on debt financing. Of course, since SFAS No. 52 was not passed by the FASB until November 1981, almost all financing decisions would have been made while SFAS No. 8 was in effect. The inclusion of foreign currency translation losses in net income would have decreased the computed financial leverage, whereas the inclusion of translation gains would have increased the computed financial leverage. This means that SFAS No. 52 had a favorable effect on the financial leverage of the adopt-early group and would have had an unfavorable effect on the financial leverage of the non-change group.

Test results summarized in Exhibit 1 indicate that no significant differences exist in the foreign asset to total asset ratios and foreign revenues to total revenues for the two groups. The revenue ratio is correlated with the asset ratio (0.7123 for the adopt-early group and 0.7186 for the non-change group); therefore, it is not surprising that the differences between the groups for both ratios are similar.

Exhibit 4. Correlation Matrix for Adopt-Early Group

| | FC80 | FC81 | PEPS | DER | RR | AR | FCR |
|------|---------|---------|---------|---------|---------|--------|--------|
| FC80 | 1.0000 | | | | | | |
| FC81 | 0.2819 | 1.0000 | | | | | |
| PEPS | 0.1170 | -0.1801 | 1.0000 | | | | |
| DER | 0.0029 | 0.1336 | -0.3342 | 1.0000 | | | |
| RR | -0.1117 | -0.4033 | 0.1449 | -0.2208 | 1.0000 | | |
| AR | -0.0187 | -0.2200 | -0.0124 | -0.1547 | 0.7123 | 1.0000 | |
| FCR | 0.0074 | 0.0510 | 0.0022 | 0.0369 | -0.0076 | 0.0192 | 1.0000 |

Correlation matrix for non-change group

| | | | | | | | |
|------|---------|---------|---------|---------|---------|---------|--------|
| FC80 | 1.0000 | | | | | | |
| FC81 | 0.8729 | 1.0000 | | | | | |
| PEPS | -0.0674 | -0.0121 | 1.0000 | | | | |
| DER | 0.0327 | 0.0626 | -0.1836 | 1.0000 | | | |
| RR | 0.3138 | 0.2907 | 0.1579 | -0.2263 | 1.0000 | | |
| AR | 0.2419 | 0.2187 | 0.1771 | -0.2145 | 0.7186 | 1.0000 | |
| FCR | -0.0531 | -0.0134 | -0.0359 | -0.1093 | -0.0257 | -0.0259 | 1.0000 |

Both ratios are slightly higher for the group that adopted SFAS No. 52 early; however, the levels of significance are only 0.5942 for the revenue ratio and 0.2369 for the asset ratio (Exhibit 1). The variances of the ratios for both groups are equal.

Moreover, the amount of 1980 foreign currency translation gains and losses is not significantly different between the groups. Although the adopt-early companies had an average translation loss of \$639,700 and the non-change group had an average translation gain of \$2,534,900, the difference is significant only at the 0.2440 level (Exhibit 1). As with the 1981 translation gains and losses, the 1980 variance for the non-change group is much higher than the variance for the group that adopted early.

The 1980 translation gains and losses for the adopt-early group are not highly correlated with the 1981 translation gains and losses for the adopt-early group, since the correlation coefficient, r , is only 0.2819 (Exhibit 4). On the other hand, the 1980 translation gains and losses are highly correlated with the 1981 gains and losses for the non-change group with an r of 0.8729. This indicates that changes in translation gains and losses between 1980 and 1981 were more closely related for companies that changed from SFAS No. 8 to SFAS No. 52 than those for companies that continued to report under SFAS No. 8.

Nonparametric Tests

Although all of the variables were not normally distributed, the sample sizes are large enough for the test results to approximate normal test results. To support the findings further, the Wilcoxon Rank Sum test was also computed for each of the seven variables of interest. Results are summarized in Exhibit 5. There were outliers in some of the variables of both groups, and the nonparametric test is not sensitive to these outliers. This factor may cause the Wilcoxon test to be appropriate for comparing the variables with outliers in the distribution. On the other hand, the Wilcoxon test assumes that the variances of the two groups are identical. F-tests were used to test for equality of variances. The test results indicate that the hypothesis of equal variances could not be rejected at the .10 level of significance in only two cases, revenue ratio and asset ratio variables. This may account for some of the differences between parametric and nonparametric test results.

Generally, the results were the same as the normal test results. However, one hypothesis rejected under the t-test failed to be rejected with the Wilcoxon test. Significant differences were found between the debt-to-equity ratios for the two groups using the t-test, but the differences were not significant using the Wilcoxon test. The p-value for the parametric test was 0.0637 (Exhibit 1) and only 0.2312 (Exhibit 5) for the nonparametric version.

Both tests strongly rejected the null hypothesis for the 1981 foreign currency translation gains and losses and the foreign currency to net income ratio. The p-values under the nonparametric test were less than 0.0001 for both variables. In addition, differences in the PEPS for the two groups were detected at a p-value of 0.0514 (Exhibit 1) for the parametric text and 0.0868 (Exhibit 5) for the nonparametric test.

Exhibit 5. Wilcoxon Test on Attributes

| Variable | A-mean | N-mean | Z obs | p-value |
|----------|--------|--------|---------|---------|
| FC80 | 88.43 | 97.59 | -1.1593 | 0.2463 |
| FC81 | 66.95 | 114.90 | -6.0415 | 0.0000 |
| PEPS | 85.96 | 99.57 | -1.7124 | 0.0868 |
| DER | 88.23 | 97.75 | -1.1973 | 0.2312 |
| RR | 97.63 | 90.17 | 0.9370 | 0.3488 |
| AR | 98.70 | 89.31 | 1.1808 | 0.2377 |
| FCR | 72.06 | 110.78 | -4.8775 | 0.0000 |

The expected values of the following variables were higher than the observed values for the group that adopted SFAS No. 52 as of December 31, 1981: 1980 foreign currency translation gains and losses; 1981 foreign currency translation gains and losses; 1981 PEPS; the debt-to-equity ratio as of December 31, 1981; and the 1981 foreign currency translation gains and losses to net income ratio. These differences in variables indicate that the values of the adopt-early group were lower than those of the group that did not adopt early, even though the means were not being considered. This is consistent with a comparison of the mean values of these variables computed in the parametric tests.

The expected values of the foreign revenue to total revenue and foreign assets to total assets ratios were lower than the observed values for the adopt-early group. This implies that these ratios were higher for the group that adopted early, which is also consistent with parametric results.

Multivariate Test on Attributes

The Hotelling T^2 simultaneously tests for differences among the mean vectors of the seven variables and between the two groups. This test is able to filter the effects of intra-group covariances and, therefore, overcomes many of the limitations of the univariate t -test.

The null hypothesis that the difference between the means for the two groups is not different from zero is rejected at the 0.0005 level of significance as presented in Exhibit 6. Test results show a T^2 of 28.6416 with an F -value of 3.9582. These results indicate that the two groups are not the same.

The 1981 foreign currency translation gains and losses for the non-change group had two extreme outliers that significantly

Exhibit 6. Hotelling T^2

| | |
|------------------------|---------|
| <hr/> | |
| Test on entire groups | |
| Hotelling T^2 | 28.6416 |
| F-Value | 3.9582 |
| p-value | 0.0005 |
| | |
| Test on reduced groups | |
| Hotelling T^2 | 35.0002 |
| F-Value | 4.8352 |
| p-value | 0.0001 |
| <hr/> | |

affected the mean for that variable. Therefore, the two observations were removed, and the test was repeated on the reduced group. The results of the second test rejected the null hypothesis more strongly with a p-value of 0.0001.

Each of the univariate t-tests either failed to reject or rejected the null hypothesis at a different level of significance, indicating the differences between the groups were not uniform for all attributes. Therefore, since the results of the univariate t-tests were mixed, the multivariate test was applied to arrive at an overall conclusion. The attributes selected for comparison were different for the group of companies that adopted SFAS No. 52 as of December 31, 1981, and the group not electing an early adoption. This implies that the decision whether to adopt SFAS No. 52 in 1981 was not a random one but was related to a company's reported financial data.

CONCLUSIONS

There are significant differences between the two groups of companies. The companies that adopted SFAS No. 52 early were able to use the standard to increase reported profits as well as their financial leverage factor.

The favorable effect on the financial leverage factor would have, in turn, a favorable effect on bond covenants. On average, companies adopting SFAS No. 52 early had a lower debt-to-equity ratio than the companies that did not adopt SFAS No. 52 as of December 31, 1981.

If management compensation is related to net income, increased profits, whether true economic profits or simply accounting profits, are beneficial to the managers who decide which accounting principles to use in the preparation of financial reports for external purposes. Further research is needed to provide evidence of a relationship between changes in accounting principles and changes in agency costs to an organization. That is, do changes in accounting standards affect any dysfunctional behavior in managers?

The results of this study also imply that managers do not believe that investors recognize the difference between economic profits and accounting profits. Behavioral studies are needed to test how managers perceive investor reaction toward accounting numbers.

LIMITATIONS

The analysis has several limitations. For example, not all foreign currency translation gains and losses can be excluded under the

provisions of SFAS No. 52. Although the excludable portion could be identified for the companies that reported under SFAS No. 52, that portion could not be isolated for the companies that reported under the provisions of SFAS No. 8. Therefore, it is impossible to determine what the effect on net profits would have been if the non-change firms had adopted SFAS No. 52 as of December 31, 1981, simply by looking at the financial disclosures. Part of the 1981 translation gains and losses may have been required to be reported in the computation of net income under the provisions of SFAS No. 52 as well.

Further, since companies were self-selected into the two categories by their decision to adopt or not to adopt SFAS No. 52 before the mandatory date, randomization does not exist. In addition, only *Fortune* 500 companies were chosen; therefore, it may not be appropriate to generalize the results beyond this category of companies.

The Hotelling T^2 multivariate test assumes normality. Tests indicated that the two groups were not normally distributed for all of the tested variables.

The question of whether or not corporate risk management practices for foreign exposure were a factor in the decision to change standards could not be addressed using publicly available information. Monetary assets and liabilities of foreign subsidiaries are not required to be disclosed in a disaggregated format. This precludes any analysis of differences in accounting exposure between the two groups.

IMPLICATIONS FOR FUTURE RESEARCH

Future research studies from two different viewpoints would be desirable to examine changes in accounting exposure before and after the change to SFAS No. 52. First, using only publicly available data, the capital structure of firms before and after the adoption should be compared. If pre-translation copies of the financial statements can be obtained, a comparison of accounting exposure before and after the change would be possible. Such a study would overcome the limitation of this inquiry that translation differences for the change group under the temporal method were not available. In addition, such a study could be useful in assessing the effect of accounting changes on corporate risk management practices.

A behavioral study, using questionnaires, may provide additional information about these effects. Corporate managers should be surveyed regarding changes in their management practices related to or caused by the changes from SFAS No. 8 to SFAS No. 52.

APPENDIX.

Companies that adopted SFAS No. 52 as of December 31, 1981

| | |
|------------------------------|-----------------------------|
| ACF Inds. | Gould Inc. |
| AMF Inds. | Harsco Corp. |
| Allegheny International Inc. | Hercules Inc. |
| Allis-Chalmers Corp. | Illinois Tool Works |
| American Brands Inc. | Ingersoll-Rand Co. |
| American Can Co. | Interlake Inc. |
| American Cyanamid Co. | Johnson & Johnson |
| American Standard Inc. | Kellogg Co. |
| AMP Inc. | Kidde Inc. |
| ARMCO Inc. | Kimberly-Clark Corp. |
| Avon Products | Libbey-Owens-Ford Co. |
| Barnes Group | Lubrizol Corp. |
| Bell & Howell Co. | McGraw-Edison Co. |
| Bemis Co. | Minnesota Mining & Mfg. Co. |
| Big Three Industries | Nashua Corp. |
| Borg-Warner Corp. | Oak Industries Inc. |
| Bucyrus-Erie Co. | Ogden Corp. |
| Carnation Co. | PPG Industries Inc. |
| Champion International Corp. | Pennwalt Corp. |
| Champion Spark Plug | Pitney-Bowes Inc. |
| Chicago Pneumatic Tool Co. | RCA Corp. |
| Cincinnati Milicron Inc. | Reichhold Chemicals Inc. |
| Clark Equipment Co. | Revlon Inc. |
| Colgate-Palmolive Co. | Robertson (HH) Co. |
| Continental Group | Scott Paper Co. |
| Crane Co. | Scovill Inc. |
| Crown Cork and Seal Co. Inc. | Squibb Corp. |
| Dana Corp. | Stanley Works |
| Dart & Kraft Inc. | Stauffer Chemical Co. |
| Dennison Mfg. Co. | Sterling Drug Inc. |
| Diamond Shamrock Corp. | Sun Chemical Corp. |
| Dover Corp. | Sybron Corp. |
| EG&G Inc. | TRW Inc. |
| Eaton Corp. | Trane Co. |
| Emhart Corp. | Uniroyal Inc. |
| Ethyl Corp. | US Gypsum Co. |
| FMC Corp. | United Technologies Corp. |
| Ferro Corp. | Upjohn Co. |
| Foxboro Co. | VF Corp. |
| Gillette Co. | Warner Communications Inc. |
| Goodrich (BF) Co. | Xerox Corp. |
| Goodyear Tire & Rubber Co. | |

Companies that did not adopt SFAS No. 52 as of December 31, 1981

| | |
|----------------------------------|--------------------------------|
| Abbott Laboratories | Lockheed Corp. |
| Allied Corp. | Lone Star Industries |
| Aluminum Co. of Amer. | Louisiana Land & Exploration |
| Amerada Hess Corp. | MAPCO Inc. |
| Ampco-Pittsburg Corp. | Merck & Co. |
| Armstrong World Inds. Inc. | Midland-Ross Corp. |
| Atlantic-Richfield Co. | Mobil Corp. |
| Bally Mfg. Corp. | Mohasco Corp. |
| Bausch & Lomb Inc. | Monsanto Co. |
| Baxter Travenol Laboratories | Motorola Inc. |
| Boise Cascade Corp. | Murphy Oil Corp. |
| Borden Inc. | NCR Corp. |
| Bristol-Myers Co. | NL Industries |
| Brunswick Corp. | Nabisco Brands Inc. |
| Burroughs Corp. | Nalco Chemical Co. |
| CBI Industries Inc. | Owens-Corning Fiberglass Corp. |
| CPC International Inc. | Owens-Illinois |
| Caterpillar Tractor Co. | Pepsico Inc. |
| Celanese Corp. | Pfizer Inc. |
| Charter Co. | Phelps Dodge Corp. |
| Chesebrough-Pond's Inc. | Philip Morris Inc. |
| Chrysler Corp. | Phillips Petroleum Co. |
| Cluett, Peabody & Co. | Raytheon Co. |
| Coastal Corp. | Reynolds (RJ) Inds. |
| Coca-Cola Co. | Reynolds Metals Co. |
| Colt Industries | Rohm & Haas Co. |
| Combustion Engineering Inc. | St. Regis Corp. |
| Control Data Corp. | Schering-Plough |
| Corning Glass Works | Searle (GD) & Co. |
| Crown Zellerbach | Signal Cos. |
| Cummins Engine | Singer Co. |
| Dow Chemical | Smith International Inc. |
| Du Pont (EI) De Nemours | Smithkline Bechman Corp. |
| Eastman Kodak Co. | Square D Co. |
| Engelhard Corp. | Standard Oil Co. (Calif.) |
| Exxon Corp. | Standard Oil Co. (Indiana) |
| Federal-Mogul Corp. | Sun Co Inc. |
| Fieldcrest Mills | Superior Oil Co. |
| Ford Motor Co. | Teneco Inc. |
| Fruehauf Corp. | Texaco Inc. |
| GAF Corp. | Texas Instruments Inc. |
| General Electric | Textron Inc. |
| General Signal Corp. | Time Inc. |
| Getty Oil Co. | Timken Co. |
| Grace (WR) & Co. | Union Carbide Corp. |
| Gulf Oil Corp. | US Steel Corp. |
| Gulf Resources & Chemical | Warner-Lambert Co. |
| Honeywell Inc. | Westinghouse Electric Corp. |
| Hughes Tool Co. | Weyerhaeuser Co. |
| Ideal Basic Industries Inc. | Witco Chemical Corp. |
| IBM Corp. | Wrigley (WM) Jr. Co. |
| Kaiser Aluminum & Chemical Corp. | |

A Study of Audit Judgments of Korean CPAs

JAMES A. HEINTZ and JIN-SOO HAN*

Audit judgment has been the subject of extensive research during the past decade. Two of the most frequently studied aspects of audit judgment have been the auditor evaluation of internal control quality and the relationship between internal control quality and audit program planning.¹ The major focus of this research has

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The research on which this paper is based was conducted while Professor Han was a doctoral candidate at Indiana University. The financial assistance of Indiana University in support of this research is gratefully acknowledged.

¹ R. H. Ashton, "An Experimental Study of Internal Control Judgments," *Journal of Accounting Research* (Spring 1974), 143-57; E. J. Joyce, "Expert Judgment in Audit Program Planning," *Journal of Accounting Research* (Supplement 1976), 29-60; R. H. Ashton and P. R. Brown, "Descriptive Modeling of Auditors' Internal Control Judgments: Replication and Extension," *Journal of Accounting Research* (Spring 1980), 269-77; R. H. Ashton and S. L. Kramer, "Students as Surrogates in Behavioral Accounting Research: Some Evidence," *Journal of Accounting Research* (Spring 1980), 1-15; R. E. Hamilton and W. F. Wright, "The Evaluation of Internal Controls over Payroll" (Research Paper No. 387, Graduate School of Business, Stanford University, 1977), and "Internal Control Judgments and Effects of Experience: Replications and Extensions," *Journal of Accounting Research* (Autumn 1982, Part II), 756-65; B. R. Gaumnitz, T. R. Nunamaker, J. J. Surdick, and M. F. Thomas, "Auditor Consensus in Internal Control Evaluation and Audit Program Planning," *Journal of Accounting Research* (Autumn 1982, Part II), 745-55; Brian G. Gaber, "An Empirical Study of Audit Judgment in Program Planning" (Ph.D. diss., University of Wisconsin, 1983); R. Tabor, "Internal Control Evaluations and Audit Program Revisions: Some Additional Evidence," *Journal of Accounting Research* (Spring 1983), 348-54; K. T. Trotman, P. W. Yetton, and I. R. Zimmer, "Individual and Group Judgments of Internal Control Systems," *Journal of Accounting Research* (Spring 1983), 286-92; and K. T. Trotman and P. W. Yetton, "The Effect of the Review Process on Auditor Judgments," *Journal of Accounting Research* (Spring 1985), 256-67.

been on whether professional auditors exhibit consistency in the judgment process.

Although the list of audit judgment studies has been growing impressively, no attention has been directed to the international dimension of audit judgment. Specifically, do auditors in different countries exhibit similar audit judgment? Because of the number and size of multinational corporations with major operations in different countries today, this is an important issue to many parties involved. The companies need to know the extent to which they can rely on audited reports from locations in different countries. Audit firms must know whether they can rely on the audit work by auditors in other countries. Investors need to know whether the audited financial statements of foreign companies are reliable.

In the current study, practicing South Korean (Korean hereafter) auditors were used as subjects. Korean auditors represent reasonable subjects for this research for two reasons. First, the magnitude of foreign investment in Korea is large and growing. Korea has been a rapidly developing country since the early 1970s. Many multinational corporations have branches in Korea. Further, in 1984, the Korean government implemented a new foreign investment policy designed to encourage the inflow of additional capital and technology. Second, Korean law requires that Korean branches of multinational corporations be audited by Korean certified public accountants (CPAs). This requirement makes it particularly important to study whether Korean CPAs make judgments similar to U.S. CPAs (the subjects in most prior audit judgment studies) when placed in a similar decision-making setting.

The objective of the present research, therefore, is to compare Korean auditor judgments with those of U.S. auditors as reported in numerous previous studies. The judgments involve internal control evaluations of a payroll subsystem. The comparisons focus primarily on analysis of individual judgments and individual versus team judgments. Experience and firm affiliation effects also will be considered.

PRIOR RESEARCH

As noted, no previous research has compared the judgments of auditors in different countries. There is, however, a substantial body of audit judgment research dealing with internal control evaluation that provides the foundation for the present study. Directly relevant studies from that body of research will be reviewed briefly.

Before reviewing prior research on auditor internal control evaluation judgments, measures of auditor performance used in these studies must be discussed. A major difficulty in studying auditor internal control evaluations is the absence of an objective criterion to distinguish correct from incorrect judgments. In other words, the "correct" measure of the strength of an internal control system, or the "correct" amount of reliance to put on a system, or the "correct" amount of audit procedures to perform in a given situation is difficult to establish. In response to this lack of an objective criterion, researchers have used judgment consistency as a measure of auditor performance in internal control evaluation. Two types of consistency, consensus and stability, have been examined in most previous studies. Consensus is judgmental agreement across judges at a point in time. Stability is judgmental agreement over time by the same judges. Although these two attributes of auditor judgment are not perfect surrogates for judgment accuracy or correctness, they are generally viewed as necessary and desirable characteristics of good judgment. Judgment consensus has become an accepted measure of auditor performance in judgment studies of the type reported here. Judgment stability is frequently reported, although not all researchers have tested for it.

Individual Judgments

The seminal study of auditor internal control evaluation judgments was by Ashton.² He had sixty-three practicing auditors judge the strength of the internal control in a payroll subsystem based on six internal control factors. Thirty-two hypothetical cases were formed by a one-half replication of a 2^6 factorial design. The cases were administered a second time six to thirteen weeks later to measure judgment stability. Judgments of the internal control strength were made on a six-point Likert scale. Auditor consensus was evaluated by correlating the scale ratings of each auditor on the thirty-two cases with the ratings of each remaining auditor. Stability was evaluated by correlating the ratings made by each auditor on the first and second administrations of the experiment. The results indicated that both the consensus and stability of the auditors' judgments were rather high, with an average correlation of .70 for consensus and .81 for stability.

Two key methodological features of Ashton's design were widely adopted in subsequent studies: (1) the use of multiple cues to

² Ashton, "Experimental Study."

create a factorial design and facilitate analysis using a Likert scale to allow statistical analysis. Both of these features were employed in replication and extension studies by Hamilton and Wright, Ashton and Brown, and Ashton and Kramer.³ All of these studies found a fairly high degree of consensus among individual auditors in terms of internal control evaluation. Hamilton and Wright and Ashton and Brown also reported high degrees of judgment stability.

In a more recent work, Gaumnitz et al. examined both internal control evaluation and audit program planning judgments.⁴ That work represented a combination of the research approaches of Ashton and of Joyce, who had studied only audit program planning judgments.⁵ Gaumnitz et al. modified Joyce's experimental task by requiring subjects first to make judgments on the quality of internal control in an accounts receivable subsystem, and then to make program planning judgments. Thirty-five practicing auditors evaluated sixteen hypothetical cases formed by a one-half replication of a 2⁵ factorial design. As in Ashton, correlation analysis was used to evaluate the judgments. The results of the aspect of the study that is of interest here (internal control evaluation) are very similar to those of Ashton. The auditors exhibited rather high levels of consensus (.704) and stability (.825) in internal control evaluation.

Gaber also combined the Ashton and Joyce tasks.⁶ In addition, he increased the complexity and realism of the experimental task to make it more representative of real-world auditing situations. Using a representative design, Gaber had 120 practicing auditors review five cases and then make internal control and audit program planning judgments for each case. Gaber's internal control evaluation results are noticeably different from those of the previous studies reviewed. He reported a mean correlation of only .51 for internal control judgments. This could be attributable to the increased complexity and realism of the task compared with the previous internal control evaluation studies.

Team Judgments

Trotman, Yetton, and Zimmer, and Trotman and Yetton extended the audit judgment research by comparing individual and team judgments in payroll internal control evaluation tasks.⁷ Trotman,

³ Hamilton and Wright, "Evaluation of Internal Controls"; Ashton and Brown, "Auditor's Internal Control Judgments"; and Ashton and Kramer, "Students as Surrogates."

⁴ Gaumnitz et al., "Auditor Consensus."

⁵ Ashton, "Experimental Study"; and Joyce, "Expert Judgment."

⁶ Gaber, "Audit Judgment."

⁷ Trotman, Yetton, and Zimmer, "Judgments of Internal Control Systems"; and Trotman and Yetton, "Auditor Judgments."

Yetton, and Zimmer had 105 advanced auditing students evaluate thirty-two hypothetical cases formed by a fractional replication of a 2^{10} factorial design. Judgments for the thirty-two cases were first made individually by each subject. Subjects were then assigned to a two- or three-member team which made the thirty-two internal control evaluation judgments as an interacting group. In addition, the researchers calculated correlations for mathematically aggregated two- and three-member teams.

The results (see Exhibit 1) indicated that the level of consensus among the individual subjects was lower (.56) than that of all previous studies of auditor internal control evaluation except for that by Gaber.⁸ Trotman, Yetton, and Zimmer state that the lower consensus may be due to the combined effect of the use of student subjects and an increased number of cues. The results also indicated that the team judgments exhibited a much higher level of consensus than the individual judgments. In fact, the correlations of the team judgments are similar to those for individual judgments in previous studies. The effects of the inexperience of student subjects and the increased number of cues appear to have been overcome in this study by combining the judgment inputs of teams of subjects. It also should be noted that the mathematically aggregated groups exhibited much higher consensus than the interacting groups. This result is attributable to the use of inexperienced student subjects, particularly in light of the subsequent findings of Trotman and Yetton,⁹ which are reviewed here.

Trotman and Yetton used seventy-five practicing auditors as subjects.¹⁰ This study employed a representative design by selecting fifteen computerized payroll system cases from the files of a large

Exhibit 1. Summary Results of Trotman, Yetton, and Zimmer

| Subjects | Consensus (Mean correlation) |
|----------------------------------|---------------------------------|
| Individuals | .56 |
| Two-member mathematical groups | .69 |
| Three-member mathematical groups | .79 |
| Two-member interacting groups | .61 |
| Three-member interacting groups | .68 |

Source: R. T. Trotman, P. W. Yetton, and I. R. Zimmer, "Individual and Group Judgments of Internal Control Systems," *Journal of Accounting Research* (Spring 1983), 286-92.

⁸ Gaber, "Audit Judgment."

⁹ Trotman and Yetton, "Auditor Judgments."

¹⁰ Ibid.

public accounting firm. Judgments of the fifteen cases were first made individually by fifty-one of the subjects. These subjects were then assigned to two-person teams which made the same judgments, as interacting groups. Finally, twenty-four subjects not otherwise involved in the internal control judgments reviewed fifteen judgments selected at random from the pool of judgments made by twenty-four other subjects. This process generated twenty-four additional judgments for each of the fifteen cases.

The results for the individual auditors indicated a high (.701) level of consensus. Other results are consistent with Trotman, Yetton, and Zimmer, in that the reviewers, interacting groups, and mathematically aggregated groups all exhibited higher levels of consensus (.793, .800, and .808, respectively) than the individual subjects.

Summary

Selected results of these studies of auditor internal control judgments are summarized in Exhibit 2. Two aspects of these results are important for purposes of the present study. First, with the exception of Gaber and Trotman, Yetton, and Zimmer,¹¹ individual auditors have exhibited a fairly high degree of consensus (.66-.704). Second, team judgments have consistently demonstrated higher degrees of consensus than individual judgments. This has been true whether the judgment was in the form of a reviewer, an interacting group, or simply a mathematically aggregated group.

The pattern of results in the previous studies suggests that it would be reasonable to use the results as a benchmark against which to evaluate the performance of the Korean auditors in the present study. Specifically, individual Korean auditors would be expected to exhibit a level of consensus similar to that found in the previous studies (.66-.704), and teams of Korean auditors would be expected to exhibit higher levels of consensus than individual auditors.

RESEARCH METHOD

Task

To facilitate comparison with prior studies, the task used in the current study was similar to the one used by Ashton, versions of which were subsequently employed by Hamilton and Wright,

¹¹ Gaber, "Audit Judgment"; and Trotman, Yetton, and Zimmer, "Judgments of Internal Control Systems."

Exhibit 2. Auditor Internal Control Evaluation Judgments — Summary of Prior Research

| Study | No. of auditors | No. of cases | No. of cues | Individual | Correlation coefficients | | |
|------------------------------------|-----------------|--------------|-------------|------------|--------------------------|--------------------|---------------------|
| | | | | | Reviewer | Interacting groups | Mathematical groups |
| Ashton (1974) | 63 | 32 | 6 | .7 | | | |
| Hamilton and Wright (1977) | 17 | 32 | 5 | .66 | | | |
| Ashton and Brown (1980) | 31 | 128 | 8 | .67 | | | |
| Ashton and Kramer (1980) | 30 | 32 | 6 | .66 | | | |
| Gaumnitz et al. (1982) | 35 | 16 | 5 | .704 | | | |
| Gaber (1983) | 120 | 5 | * | .51 | | | |
| Trotman, Yetton, and Zimmer (1983) | 105 | 32 | 10 | .56 | | .61/.68† | .69/.79† |
| Trotman and Yetton (1985) | 75 | 15 | * | .701 | .793 | .800 | .808 |

* A representative rather than a factorial design was used.

† Correlation coefficients are for two- and three-person groups, respectively.

Ashton and Brown, and Ashton and Kramer.¹² Five of the six dichotomously scaled variables for the payroll internal control system used in Ashton's study were used here. The variables are listed in Exhibit 3. The one variable from Ashton not used here is "Was the internal control over payroll found to be satisfactory during the previous year?" This variable was deleted to focus the subjects' attention solely on the current year environment. Subjects were asked to make judgments on the quality of the internal control of the hypothetical firm using a six-point interval scale.

The experimental questionnaire was originally prepared in English (see Appendix). It was translated into Korean and then back into English by a different translator. There was no difference between the translated-to-English version and the original one. This tactic of back-translation provides a rigorous method for verifying translation equivalence.¹³ The actual experiment was conducted using the Korean version.

Subjects

The subjects were thirty-six practicing auditors employed by three large public accounting firms in Seoul, South Korea. Subjects were not randomly selected from each of the three firms. They were secured by contacting partners in each of the firms, explaining the nature of the proposed research, and requesting the cooperation of twelve auditors to perform the experiment. The selection of

Exhibit 3. Questions Depicting Characteristics of Payroll Internal Control System

-
1. Are the tasks of timekeeping and payment of employees adequately separated from the task of payroll preparation? Yes _____ No _____
 2. Are the tasks of both payroll preparation and payment of employees adequately separated from the task of bank account reconciliation?
Yes _____ No _____
 3. Are the names on the payroll checked periodically against the active employee file of the personnel department? Yes _____ No _____
 4. Are formal procedures established for changing names on the payroll, pay rates, and deductions? Yes _____ No _____
 5. Is the payroll audited periodically by internal auditors?
Yes _____ No _____
-

¹² Ashton, "Experimental Study"; Hamilton and Wright, "Evaluation of Internal Controls" and "Internal Control Judgments"; Ashton and Brown, "Auditors' Internal Control Judgments"; and Ashton and Kramer, "Students as Surrogates."

¹³ C. E. Osgood, W. H. May, and M. S. Miron, *Cross-Cultural Universals of Affective Meanings* (Urbana, Ill.: University of Illinois Press, 1975).

subjects within each firm was made internally on the basis of availability.

The auditing experience of subjects ranged from one to ten years. Exhibit 4 presents the distribution of years of experience by firm affiliation.

Experimental Design

A one-half replication of a 2^5 factorial design was used in this research. A one-half factorial design was selected to reduce the total time required of each subject to respond to the cases. Each of the five independent variables was manipulated across two levels. Therefore, each subject evaluated the internal control strength of sixteen different cases ($\frac{1}{2} \times 2^5 = 16$). The sixteen combinations were randomly ordered. Four duplicate cases were selected at random from the sixteen and added to the end of the instrument to permit an assessment of test-retest reliability (judgment stability) for each subject.

The team judgments of internal control strength were made by the same subjects who first made the judgments as individuals. Investigators of individual versus group problem solving have used a variety of experimental designs. The two most common designs are (1) requiring individuals to solve problems alone and having the same individuals attempt to solve the problem in groups; and (2) having one sample of individuals attempt to solve a set of problems and another sample of groups attempt to solve the same set of problems. Shaw has shown that, despite the variations in design and procedures, the results of the two designs are remarkably consistent where learning effects are reported to be trivial.¹⁴ The first design has learning effects problems, whereas the second design has a problem with random selection (homogeneous sample selection). Based on the fact that the two designs appear to produce similar results, and due to subject availability constraints, the first

Exhibit 4. Subject Experience Level by Firm Affiliation

| Experience (years) | Firm | | | Total |
|-----------------------|------|----|----|-------|
| | A | B | C | |
| 1- 2 | 2 | 6 | 5 | 13 |
| 3- 4 | 7 | 1 | 3 | 11 |
| 5-10 | 3 | 5 | 4 | 12 |
| Total | 12 | 12 | 12 | 36 |

¹⁴ M. E. Shaw, *Group Dynamics* (New York: McGraw-Hill, 1976).

design was used in the present research. By having subjects solve problems first individually and then in groups, the number of subjects could be reduced by one-half without losing power.

Procedures

The experiment was conducted by visiting the public accounting firms and meeting with the auditors in small groups. The two phases of the experiment were conducted sequentially. First, the subjects were provided with brief oral instructions concerning the judgment task. They were then presented with a package of experimental materials containing (1) background data concerning the hypothetical firm; (2) the stimulus combinations on which judgments were to be made; and (3) a debriefing questionnaire (see Appendix). The instructions stressed the importance of working individually. Each subject, based on the background information and the stimulus combinations, evaluated the strength of internal control for each case. The debriefing questionnaire elicited information regarding firm affiliation, experience, and time spent completing the experiment.

Following the individual judgment task, subjects were assigned to three-member groups. Each group then repeated the experimental task. In the case of two teams, time constraints precluded completion of the team judgments on the same day the individual judgments were made. The team judgments for these teams were collected the following day. The only difference was that a group rather than an individual judgment was required. There were two reasons for using triad groups. First, it is common for actual audit teams to be composed of three auditors (e.g., staff, senior, and manager). Second, in Trotman, Yetton, and Zimmer, three-member groups outperformed two-member groups in evaluating internal control.¹⁵

RESULTS

Individual Judgments — Consensus and Stability

To measure the degree of consensus among the auditors, Pearson product-moment correlation coefficients between the ratings of all pairs of auditors on the sixteen cases were calculated. The average correlation coefficient obtained was .717. The range of correlation coefficients was generally from the lower .50s to the upper .80s. A small number of correlation coefficients had values between .19 and .49 (approximately 5 percent) and between .90 and .94 (approximately 2 percent).

¹⁵ Trotman, Yetton, and Zimmer, "Judgments of Internal Control Systems."

These results are similar to those of Ashton.¹⁶ The average correlation in Ashton's study was .70. Ashton's range was generally from the lower .40s to the upper .80s. Approximately 3 percent of his correlation coefficients had values between .06 and .40, and approximately 1 percent was between .90 and .93. The results are also consistent with those reported by Hamilton and Wright, Ashton and Brown, Ashton and Kramer, and Gaumnitz et al., and with those reported for individual auditors by Trotman and Yetton,¹⁷ which were summarized in Exhibit 2.

As explained in the section on research method, four duplicate stimulus combinations were chosen at random and included as the last cases for the auditors to evaluate. To measure judgment stability, correlations were calculated between judgments on the original four cases and the duplicates. The mean test-retest reliability was .837, with a range from .333 to 1.000. The results for the current study and several previous studies that tested for stability in the same way are summarized in Exhibit 5. The results clearly are quite similar, although the range is slightly wider in the current study.

Individual versus Team Judgments — Consensus and Stability

To measure the degree of consensus among the teams of auditors, Pearson product moment correlation coefficients between the ratings of all pairs of teams of auditors on the sixteen cases were calculated. The average correlation coefficient obtained was .819. This level of consensus was significantly ($p < .01$) higher than that among individuals (.717). These results and those for the Trotman, Yetton, and Zimmer, and the Trotman and Yetton studies¹⁸ are

Exhibit 5. Comparison of Judgment Stability Results

| Study | Correlation coefficients | | |
|-------------------------|--------------------------|---------|------|
| | Lowest | Highest | Mean |
| Ashton (1974) | .43 | .96 | .81 |
| Ashton and Brown (1980) | .62 | .99 | .91 |
| Gaumnitz et al. (1982) | .578 | .982 | .825 |
| Current study | .33 | 1.0 | .837 |

¹⁶ Ashton, "Experimental Study."

¹⁷ Hamilton and Wright, "Evaluation of Internal Controls"; Ashton and Brown, "Auditors' Internal Control Judgments"; Ashton and Kramer, "Students as Surrogates"; Gaumnitz et al., "Auditor Consensus"; and Trotman and Yetton, "Auditor Judgments."

¹⁸ Trotman, Yetton, and Zimmer, "Judgments of Internal Control Systems"; and Trotman and Yetton, "Auditor Judgments."

summarized in Exhibit 6. The results for the current study appear to be similar to the prior studies, particularly Trotman and Yetton, which used practicing auditors rather than students as subjects.

With respect to stability, the average correlation between the team judgments on the original four cases and the duplicates was .873 compared with .837 for individual judgments (see Exhibit 6). Although the measure of team judgment stability is higher than that for the individual judgments, the difference is not significant ($p = .45$). As presented in Exhibit 6, the differences between the individual and team stability measures in Trotman, Yetton, and Zimmer were statistically significant.

Firm Affiliation and Experience Effects

One-way analysis of variance (ANOVA) was used to test for the effect of firm affiliation on mean inter-auditor consensus. As presented in Exhibit 7, the effect clearly was significant ($F = 15.453$, $p < .001$). Information in the exhibit indicates that Firm C auditors agreed more with auditors of other firms than with each other, whereas Firm A auditors agreed more with each other than with auditors of other firms.

The results of prior research on internal control evaluation judgments have been inconsistent with respect to firm effects. Ashton, and Ashton and Brown found insignificant differences in

Exhibit 6. Comparison of Individual and Team Consensus and Stability Results

| Study | Subjects | Correlation coefficient | |
|--|----------------------------------|-------------------------|-----------|
| | | Consensus | Stability |
| Trotman, Yetton, and Zimmer (1983) | Individuals | .56* | .73* |
| | Two-member interacting team | .61* | .82* |
| | Three-member interacting team | .68* | .86* |
| | | | |
| Trotman and Yetton (1985) | Individuals | .701* | |
| | Two-member interacting team | .800* | |
| Current study | Individuals | .717* | .837 |
| | Three-member interacting team | .819* | .873 |

* Significant ($p < .01$) difference between individual and team correlations.

Exhibit 7. Effect of Firm Affiliation and Experience on Consensus

| Firm affiliation* | | | |
|-------------------|----------|----------|----------|
| <u>Firm</u> | <u>A</u> | <u>B</u> | <u>C</u> |
| A | .7756 | | |
| B | .7473 | .7177 | |
| C | .7071 | .6976 | .6529 |

| Experience† | | | |
|--------------|------------|------------|-------------|
| <u>Years</u> | <u>1-2</u> | <u>3-4</u> | <u>5-10</u> |
| 1-2 | .6725 | | |
| 3-4 | .6914 | .7055 | |
| 5-10 | .7079 | .7233 | .7609 |

* Significant difference ($F = 15.453$, $p < .001$).

† Significant difference ($F = 5.718$, $p < .01$).

inter-auditor consensus.¹⁹ In contrast, Hamilton and Wright, and Gaumnitz et al. found significant firm effects.²⁰ The results of the current research obviously support the findings of the two more recent studies.

One-way ANOVA was also performed to test for the relationship between experience and consensus. The results reported in Exhibit 7 indicate that more experienced auditors exhibited significantly higher levels of judgmental consensus than did less experienced auditors ($F = 5.718$, $p < .01$). These results conflict with those of several prior studies, including Ashton, Ashton and Brown, and Gaumnitz et al.,²¹ which found no positive association between consensus and years of experience. Hamilton and Wright actually found a negative correlation between consensus and years of experience.²²

To test for the effects of firm affiliation and experience on judgment stability, one-way ANOVA was used once again. As presented in Exhibit 8, clearly neither effect was significant ($F = .089$, $p = .915$ for firm affiliation, and $F = 1.711$, $p = .196$ for

¹⁹ Ashton, "Experimental Study"; and Ashton and Brown, "Auditors' Internal Control Judgments."

²⁰ Hamilton and Wright, "Evaluation of Internal Controls"; and Gaumnitz et al., "Auditor Consensus."

²¹ Ashton, "Experimental Study"; Ashton and Brown, "Auditors' Internal Control Judgments"; and Gaumnitz et al., "Auditor Consensus."

²² Hamilton and Wright, "Evaluation of Internal Controls."

Exhibit 8. Effect of Firm Affiliation and Experience on Stability

| Firm affiliation* | | | |
|-------------------|----------|----------|----------|
| <u>Firm</u> | <u>A</u> | <u>B</u> | <u>C</u> |
| A | .8451 | | |
| B | .8343 | .8236 | |
| C | .8395 | .8288 | .8340 |

| Experience† | | | |
|--------------|------------|------------|-------------|
| <u>Years</u> | <u>1-2</u> | <u>3-4</u> | <u>5-10</u> |
| 1-2 | .8318 | | |
| 3-4 | .8373 | .8428 | |
| 5-10 | .8319 | .8375 | .8321 |

* ($F = .089$, $p = .915$)† ($F = 1.711$, $p = .196$)

experience). These results are consistent with those reported by Ashton and Brown, Hamilton and Wright, and Gaumnitz et al.,²³ the only previous studies to test for the effect of firm affiliation or experience on judgment stability.

DISCUSSION

In general, the results of this study are largely consistent with prior research. For example, for individual judgment consensus, the average correlation coefficient of .717 is similar to the coefficients reported in the majority of prior studies. With the exception of the .51 and .56 correlations reported by Gaber and Trotman, Yetton, and Zimmer,²⁴ respectively, the range of correlations reported is .66 to .704 (see Exhibit 2). Similarly, for individual judgment stability, the average correlation coefficient is .837 compared with a range of .81 to .91 in prior research (see Exhibit 5).

For individual versus team judgments, prior research is rather limited, so the basis of comparison is small. Two differences are identifiable between the results of the current study and those reported by Trotman, Yetton, and Zimmer, and Trotman and Yetton²⁵: (1) the levels of consensus for individuals and teams are lower in Trotman, Yetton, and Zimmer; and (2) that study reported

²³ Ashton and Brown, "Auditors' Internal Control Judgments"; Hamilton and Wright, "Internal Control Judgments"; and Gaumnitz et al., "Auditor Consensus."

²⁴ Gaber, "Audit Judgment"; and Trotman, Yetton, and Zimmer, "Judgments of Internal Control Systems."

²⁵ Ibid.; and Trotman and Yetton, "Auditor Judgments."

a significant difference between individual and team stability. The evidence suggests that these differences could be due to the task and subjects of the Trotman, Yetton, and Zimmer study, which used ten independent variables in their internal control evaluation task compared with only five in the current study. In addition, Trotman, Yetton, and Zimmer's subjects were accounting students compared with practicing auditors in the current study. Regarding the significant difference between individual and team stability, note that the mean correlation for individuals in the Trotman, Yetton, and Zimmer study was quite low (.73) compared with the present study (.837). The lower individual mean correlation clearly allowed more room for improvement by the teams.

The effect of firm affiliation on consensus level was found to be significant. As previously noted, the findings of prior research on this issue are inconsistent; two report a significant effect and two an insignificant effect. These previous results are particularly difficult to interpret because in three of the four studies, similar judgment settings (payroll internal control system) were used. It can only be noted here that the results of the present research are consistent with the two most recent prior studies.²⁶

The significant relationship found here between experience and consensus clearly conflicts with prior research. One possible explanation for this finding is the length and nature of experience of many of the subjects in this study. Of the thirty-six subjects, thirteen had only one or two years' experience. Further, the nature of the experience of a practicing Korean auditor in the first two years differs from that of most U.S. auditors in that there is little experience with internal control evaluation. These factors could explain why the inexperienced subjects in the present study showed lower consensus than the more experienced subjects.

CONCLUSION

A major purpose of this research was to examine whether the internal control evaluation judgments of Korean auditors are similar to those judgments made by auditors who were subjects in previous behavioral research in this area. For individual auditor judgments, measured in terms of consensus and stability, the answer clearly is positive. For the individual versus team judgments, again

²⁶ Hamilton and Wright, "Internal Control Judgments"; and Gaumnitz et al., "Auditor Consensus."

measured in terms of consensus and stability, the answer is a conditional positive. Only two previous studies examined individual and team auditor judgments. The results of the present study are consistent with those reported in the one previous study that used practicing auditors as subjects.

These findings should be interpreted in light of the relationship that exists between the Korean and U.S. accounting and auditing environments. Since Korean independence in 1945, the United States and Korea have had a close economic relationship. The Korean accounting system and auditing practices closely parallel and follow the general philosophical approach of the United States. In addition, several U.S. accounting firms have established offices in Korea or affiliations with Korean accounting firms. This study found that different experts (CPAs) in different countries make similar judgments when placed in similar judgmental settings. These results could mean that U.S. accounting practices and auditing technology have been successfully transferred to Korea. The extent to which such results would be found in studies of auditors in countries without such close economic ties with the United States is unknown. This could represent an interesting subject for further research.

The findings should also be interpreted in respect to a number of limitations of this research. First, the judgment similarity has been measured in terms of consensus and stability. Although these measures have been employed in numerous previous studies in this area, they still are only surrogates for the accuracy or correctness of the judgments.

Second, the factorial design employed here necessitated a high degree of task abstraction. The experimental task was no doubt less complicated than those of actual audit situations. For example, only five payroll internal control characteristics were manipulated over two levels. It is impossible to assess the extent to which this might have influenced the subjects' judgment processes.

Third, the judgments examined here were for payroll internal control only. Neither other audit areas, such as accounts receivable or inventory, nor other audit tasks, such as program planning, were considered.

Finally, the analysis is based on only thirty-six subjects in three firms, none of which was randomly selected. Strictly speaking, therefore, the results of this study are applicable to only the tasks and subjects involved in this experiment.

APPENDIX. SAMPLE INSTRUMENT

Background Data and Instructions

Assume that you are the auditor in charge of the year-end audit of a mid-sized manufacturing company. It is a publicly held company with approximately \$5.5 million in capital. It has 2,560 employees; 25 percent of them are administrative personnel. On the average, 4 percent of the employees leave the company in a year. It hires new employees any time it needs them.

In this experiment you are concerned only with the internal control over payroll. Suppose that you have examined five internal control factors pertaining to payroll. After considering these five factors, you will rate the strength of the internal controls over payroll. In the experiment, you are asked to make twenty such ratings.

After finishing the individual evaluation, each of you will be assigned to a three-member audit team, and the same experiment will be repeated in teams.

(Situation 2)

| | Yes | No |
|--|-----|-----|
| 1. Are the tasks of timekeeping and payment of employees adequately separated from the task of payroll preparation? | () | (√) |
| 2. Are the tasks of both payroll preparation and payment of employees adequately separated from the task of bank account reconciliation? | () | (√) |
| 3. Are the names on the payroll checked periodically against the active employee file of the personnel department? | (√) | () |
| 4. Are formal procedures established for changing names on the payroll, pay rates, and deductions? | (√) | () |
| 5. Is the payroll audited periodically by internal auditors? | (√) | () |

Based on the background data and the information in Situation 2, indicate the strength of the internal controls over payroll by checking the number most closely associated with your assessment.

| | | | | | |
|------------------------|-------------------|------------------------------|-----------------------|----------------------------|----------------------------|
| extremely weak I | very weak I | substantial weakness I | some weakness I | not quite adequate I | adequate to strong I |
| 1 | 2 | 3 | 4 | 5 | 6 |
| () | () | () | () | () | () |

What is the name of your accounting firm, and how long have you been employed as auditor?

name of firm audit experience

Finally, how long did it take you to complete the twenty cases?
() minutes

Thank you for your cooperation.

*Exchange Rates and Purchasing Power Parity:
Evidence Regarding the Failure of SFAS No.
52 to Consider Exchange Risk in Hyper-
Inflationary Countries*

DAVID A. ZIEBART*

The accounting for foreign operations and the reporting of exposure to potential exchange risk have important implications for many multinational corporations (MNCs) and their investors. The financial statements of MNCs are intended to provide one source of information regarding the effects of exposure to exchange risk. However, the accounting requirements of Statement of Financial Accounting Standard (SFAS) No. 52 fail to disclose fully exposure to exchange risk. This occurs since the implied assumptions, inherent in the required accounting practices, regarding the movements of exchange rates with price level changes are not met in many hyper-inflationary economies.

This study empirically investigates the implicit assumptions of SFAS No. 52 in situations of hyper-inflation. The assumption that balance sheet items translated at the historical exchange rate are not exposed to exchange gains or losses is empirically shown to be false through application of the purchasing power parity (PPP) theorem. The empirical evidence supports the concept that most hyper-inflationary foreign countries systematically experience exchange risk exposure.

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An illustration of the effects of exchange risk of the valuation of fixed assets is provided in the following section. The reporting requirements of SFAS No. 52 in hyper-inflationary economies and a brief discussion of the purchasing power parity theorem are provided in the third section. The fourth section reports the empirical evidence regarding the long-run validity of the purchasing power parity theorem for eighteen countries which meet the SFAS No. 52 hyper-inflation criterion. Countries in which favorable or unfavorable systematic exchange risk exposure exists are identified for a number of hyper-inflationary countries. The implications of the empirical results and a summary are discussed in the final section.

AN ILLUSTRATION REGARDING THE EFFECT OF EXCHANGE RISK ON THE VALUATION OF FIXED ASSETS

Assume that XYZ Corporation simultaneously purchases fixed assets in three different countries experiencing hyper-inflation. At the time of purchase, the U.S. dollar value for each of the purchases is \$100.00. The exchange rates for the three countries are as follows:

- Country A: 3.5 local currency units to \$1.00
- Country B: 20 local currency units to \$1.00
- Country C: 1 local currency unit to \$1.00.

The purchases in foreign currency units are

- Country A: 350.00
- Country B: 2,000.00
- Country C: 100.0

Let us assume that over a period of time, there is 100 percent inflation in all three of the foreign countries and (for simplicity) there is no inflation in the United States. In Country A, the actual exchange rate rises to 8.50 units to \$1.00. The purchasing power parity implied exchange rate for Country A should be 7.00 units to \$1.00 $\{3.5 \times (1 + 1.00)/(1 + .0)\}$. The parity error is positive and the firm has experienced exposure to unfavorable exchange risk.

Given that the price level of the fixed asset rises at the inflation rate of 100 percent, the corporation could sell the asset in the foreign market for 700.00, which has a current exchange value in U.S. dollars of \$82.35; the firm has experienced an economic loss of \$17.65. For financial reporting purposes, the asset would be valued at \$100.00. The reporting requirements of SFAS No.

52 overstate the value of a fixed asset in situations of unfavorable long-term exchange risk exposure.

In Country B, the exchange rate rises during the period from 20.00 to 30.00 units per \$1.00. In this instance, a negative parity error occurs since the actual exchange rate is less than the parity exchange rate. The parity exchange rate is 40.00 units per \$1.00 $\{20.00 \times (1 + 1.00)/(1 + .0)\}$. In such situations, the corporation is exposed to favorable exchange risk. Assuming that the price of the asset rises at the inflation rate, the price of the asset at the end of the period in the foreign currency is 4,000.00 units. Given the actual exchange rate of 30.00, however, the asset could be sold in the foreign market for 4,000.00, which can be translated into U.S. currency as \$133.33. The corporation has experienced an economic gain, but the reporting requirements fail to disclose this event in any way on the firm's financial statements.

In Country C, the exchange rate rises to 2.00 per \$1.00 and the PPP theorem holds; the firm is not exposed to foreign exchange risk. In this situation, the price of the asset rises to 2,000.00, but this increase in the price of the asset is offset by the increase in the exchange rate. The reported value on the balance sheet of \$100.00 is appropriate since there is no exposure to exchange risk during the period.

These three cases illustrate three possible scenarios regarding the exposure of fixed assets to exchange risk. Indeed, as Aliber and Stickney note, when there is no exchange risk (Country C), it is quite appropriate to use the historical cost and historical exchange rate for balance sheet valuation.¹ When the PPP theorem does not hold (Countries A and B), however, fixed assets are exposed to exchange risk, and the current reporting practices of SFAS No. 52 for subsidiaries in hyper-inflationary countries are deficient. Empirical evidence regarding the extent to which the PPP theorem holds in countries meeting the hyper-inflationary requirement of SFAS No. 52 is provided in a subsequent section.

BACKGROUND

Statement No. 52 of the Financial Accounting Standards Board (FASB) was accepted by the accounting community as a replacement for FASB Statement No. 8 because it seemed to alleviate the latter's reporting problems. Other problems, however, such as exchange risk exposure, were overlooked by the new pronouncement.

¹ R. Aliber and C. Stickney, "Accounting Measures of Foreign Exchange Exposure: The Long and Short of It," *Accounting Review* (January 1975), 44-57.

SFAS No. 8 was very controversial and was attacked on the grounds that it required firms to report foreign currency translation gains or losses in the income statement. Many people believed that the reporting requirements of SFAS No. 8 had little correspondence with the actual economic condition of the firm. Supposedly to achieve comparability of the reported results with the economic situation, SFAS No. 52 allows a firm the discretion (within certain guidelines) to select the foreign subsidiary's functional currency. The functional currency selected then determines the accounting method to be employed.

The required accounting practices of SFAS No. 52 can be summarized as follows:

1. If the foreign subsidiary is deemed to be a conduit for U.S. operations in the foreign country or an extension of the domestic operations, the functional currency is the U.S. dollar. The accounting treatment in this case requires the monetary assets and liabilities of the foreign operations to be translated at the current rate of exchange, revenues and expenses to be translated at the rate of exchange at the time of the transaction, and non-monetary items to be kept at the historical cost/historical rate of exchange. Gains and losses on the foreign currency adjustments are recognized in the income statement, and the monetary balance sheet items are carried in the consolidated balance sheet at the current exchange rate. Non-monetary items remain at the historical cost and historical rate of exchange in the consolidated balance sheet.
2. If the foreign subsidiary is deemed to be a relatively self-supporting entity, the functional currency is the currency of the foreign country. The foreign subsidiary's income statement is consolidated with the parent at the current rate of exchange, and no gains or losses on foreign currency translation are recognized in the income statement. The balance sheet of the foreign subsidiary is consolidated with the parent at the historical cost adjusted for the current exchange rate.
3. If the foreign subsidiary operates in a country that has experienced a cumulative inflation rate over a three-year period equal to or greater than 100 percent, the functional currency is required by SFAS No. 52 to be the U.S. dollar and the accounting requirements are the same as for point 1. Gains or losses on monetary assets and liabilities are included in income, but non-monetary items remain at the historical cost and historical rate of exchange.

Accordingly, in instances in which hyper-inflation exists, the non-

monetary items are carried at the original cost and the original historical exchange rate. In essence, it is assumed that non-monetary items are not exposed to exchange gains or losses since any exchange gain or loss would be offset by a change in the local currency price of the asset. As Aliber and Stickney note, the use of the historical exchange rate for non-monetary items is based on the belief that exchange gains and losses are offset by changes in the local currency prices of the non-monetary items.² This failure to consider the potential exchange risk for non-monetary items presumes that the PPP theory does hold.

The purchasing power parity theory ties the change in the foreign exchange rate between two countries to the change in price levels for the two countries. Changes in the equilibrium exchange rate are proportional to changes in the ratio of foreign to domestic prices. Lee³ and Officer⁴ provide a current and extensive review of the PPP theory.

Aliber and Stickney investigated the validity of the purchasing power parity theory for forty-eight countries for the period 1960 to 1971. They concluded that, over fairly long time periods, the validity of the PPP theory increases and that most assets and liabilities are not exposed to exchange gains and losses.⁵ They did not focus on hyper-inflationary countries, however, and their technique to measure the parity error, on which they base their conclusion, may be suspect.

Intuitively, one might expect to observe larger deviations between actual exchange rates and the theoretically determined parity exchange rates in countries with extremely high rates of inflation. These countries may undertake practices to keep their exchange rates higher than the purchasing power parity implied exchange rate or lower than parity if it is in their self-interest to do so. If this does occur, one would expect to find the purchasing power parity theory to be less valid in these hyper-inflationary countries and, therefore, the required use of historical cost and historical exchange rates to be inappropriate. In addition, systematic favorable long-term exchange risk exposure will result in countries which keep their exchange rates lower than parity. Systematic unfavorable exchange risk exposure will occur when countries allow their exchange rate to rise higher than the implied parity

² Ibid.

³ M. Lee, *Purchasing Power Parity* (New York: Marcel Dekker, 1976).

⁴ L. Officer, *Purchasing Power Parity and Exchange Rates: Theory, Evidence and Relevance* (Greenwich, Conn.: JAI Press, 1982).

⁵ Aliber and Stickney, "Accounting Measures."

rate. Evidence regarding the validity of the PPP theory for hyper-inflationary countries, as well as evidence of systematic favorable or unfavorable exchange risk exposure for long-term assets, is provided in the following section.

EMPIRICAL EVIDENCE

Consumer price change information for 121 countries was surveyed from 1955 through 1983 to determine those countries which meet the SFAS No. 52 criterion for hyper-inflation. Exhibit 1 provides a list of eighteen countries which meet the criterion of a cumulative inflation rate of 100 percent over a three-year period. The years of analysis are provided since information for all twenty-eight years is not available for all countries. Exhibit 1 also provides the average inflation rate, as well as the high and low yearly rates. For comparative purposes, the U.S. average inflation rate during the period 1955 to 1983 is 4.7 percent, with a high of 13.5 percent and a low of $-.3$ percent.

To determine the contemporaneity of meeting the SFAS No. 52 criterion, an additional analysis is conducted to determine the time periods in which the hyper-inflationary criterion is met. Sixteen of the countries meet the criterion during the 1980s and twelve

Exhibit 1. Hyper-Inflationary Countries

| Country | Time period | Average inflation rate (%) | High (%) | Low (%) |
|--------------|-------------|----------------------------|----------|---------|
| Argentina | 1955-1983 | 73.2 | 443.2 | 7.7 |
| Bangladesh | 1972-1983 | 20.0 | 54.7 | - 9.6 |
| Bolivia | 1955-1983 | 37.9 | 275.6 | - .7 |
| Brazil | 1955-1983 | 44.0 | 142.0 | 10.0 |
| Chile | 1964-1983 | 100.3 | 504.7 | 9.9 |
| Costa Rica | 1955-1983 | 10.6 | 90.1 | - .7 |
| Ghana | 1955-1983 | 27.2 | 122.9 | - 8.5 |
| Iceland | 1955-1983 | 23.5 | 86.0 | 3.0 |
| Israel | 1955-1983 | 31.6 | 145.6 | 1.7 |
| Mexico | 1955-1983 | 14.8 | 101.9 | .6 |
| Nicaragua | 1973-1983 | 20.9 | 48.2 | 2.8 |
| Peru | 1955-1983 | 24.5 | 111.2 | 4.8 |
| Sierra Leone | 1955-1983 | 10.2 | 69.7 | - 3.7 |
| Somalia | 1955-1983 | 10.9 | 58.8 | - 7.5 |
| Turkey | 1955-1983 | 19.5 | 110.2 | .4 |
| Uruguay | 1955-1983 | 51.2 | 125.3 | 10.9 |
| Yugoslavia | 1955-1983 | 15.9 | 39.7 | 1.4 |
| Zaire | 1955-1983 | 25.7 | 108.6 | - 2.7 |

during the 1970s. Ten of the countries meet the criterion during both the 1970s and the 1980s, but none of the countries meets the criterion only prior to 1970. This implies that the hyper-inflation situation is contemporary in most of the countries. Exhibit 2 summarizes the results.

To obtain some insight into the degree of U.S. multinational investment, the total assets of the affiliates, as well as the magnitude of the U.S. multinational investment as of 1977, are provided in Exhibit 3.

For each of the eighteen countries, the PPP exchange rate is computed based on the relative changes in inflation and the previous year's actual ending exchange rate. This extends the analysis of Aliber and Stickney⁶ for eleven of the hyper-inflationary countries. The PPP exchange rate is computed as

$$E_{t-1} \times (1 + I_f)/(1 + I_d) \quad (1)$$

where E_{t-1} is the current year consumer price level change for the foreign country, and I_d is the current year consumer price level change in the United States. The computed parity error is the actual end of the current year exchange rate less the implied

Exhibit 2. Time Periods in Which the Hyper-Inflation Criterion Is Met

| Country | 1950s* | 1960s | 1970s | 1980s† |
|--------------|--------|-------|-------|--------|
| Argentina | X | | X | X |
| Bangladesh | | | X | |
| Bolivia | X | | X | X |
| Brazil | | X | X | X |
| Chile | | | X | |
| Costa Rica | | | | X |
| Ghana | | | X | X |
| Iceland | | | X | X |
| Israel | | | X | X |
| Mexico | | | | X |
| Nicaragua | | | | X |
| Peru | | | X | X |
| Sierra Leone | | | | X |
| Somalia | | | | X |
| Turkey | | | X | X |
| Uruguay | | X | X | X |
| Yugoslavia | | | | X |
| Zaire | | X | X | X |

* 1950s is limited to 1955-1959.

† 1980s is limited to 1980-1983.

⁶ Ibid.

**Exhibit 3. U.S. Multinational Investment in Hyper-Inflationary Countries
(as of 1977)**

| Country | Number of affiliates | Total assets | U.S. MNC investment (in millions) | Total assets (%) |
|--------------|-------------------------|-----------------|---|------------------------|
| Argentina | 279 | 3,966 | 1,262 | 32 |
| Bangladesh | 11 | 34 | 5 | 15 |
| Bolivia | 39 | 249 | 117 | 47 |
| Brazil | 790 | 21,235 | 5,695 | 27 |
| Chile | 75 | 414 | 159 | 38 |
| Costa Rica | 113 | 426 | 178 | 42 |
| Ghana | 24 | 346 | 124 | 36 |
| Iceland | 3 | N/A | 5 | N/A |
| Israel | 107 | 3,146 | 253 | 8 |
| Mexico | 1,090 | 9,754 | 3,201 | 33 |
| Nicaragua | 70 | 527 | 108 | 20 |
| Peru | 127 | 1,772 | 1,160 | 65 |
| Sierra Leone | 9 | 61 | 9 | 15 |
| Somalia | 1 | N/A | N/A | N/A |
| Turkey | 45 | 900 | 221 | 23 |
| Uruguay | 41 | 240 | 66 | 28 |
| Yugoslavia | 6 | 94 | N/A | N/A |
| Zaire | 24 | 475 | 151 | 32 |

purchasing power parity exchange rate. Exhibit 4 provides summary information regarding the number of years in which the error is positive or negative, the total error over the period of analysis, the average error, the cumulative percentage error, and the average percentage error.

These results are fairly consistent with the findings of Aliber and Stickney.⁷ In most instances, the parity errors are not systematically positive or negative, and the average percentage error is quite small. This evidence seems to support the concept that the PPP theorem holds in the long run and that there is little systematic exchange risk exposure.

However, this method of computing the implied purchasing power parity exchange rate treats every year as independent since the computation assumes that the beginning exchange rate (last year's end-of-the-year rate) has been appropriately adjusted for changes in price levels that occurred in the preceding year. Accordingly, the parity error is based only on results for a single year, and the error does not consider any uncorrected parity errors from previous periods. The average percentage error is somewhat

⁷ Ibid.

Exhibit 4. Summary of Computed Parity Errors

| Country | Years of analysis | Number of years with | | Parity error* | | Parity error (%) | |
|--------------|-------------------|----------------------|-----------------|---------------|---------|------------------|---------|
| | | Positive errors | Negative errors | Cumulative | Average | Cumulative | Average |
| Argentina | 1956-1982 | 8 | 19 | 31,797.1 | 1,135.6 | -231 | -8.0 |
| Bangladesh | 1973-1983 | 6 | 5 | 8.2 | .7 | 6 | .5 |
| Bolivia | 1956-1983 | 11 | 17 | -88.2 | -3.1 | -63 | -2.0 |
| Brazil | 1956-1983 | 14 | 14 | 421.7 | 15.1 | 51 | 1.0 |
| Chile | 1965-1983 | 8 | 11 | 4.7 | .2 | 34 | 1.0 |
| Costa Rica | 1956-1983 | 19 | 9 | -5.5 | -.2 | 10 | .3 |
| Ghana | 1956-1983 | 8 | 20 | 17.7 | .6 | -304 | -10.0 |
| Iceland | 1956-1983 | 11 | 17 | 7.7 | .3 | 37 | 1.0 |
| Israel | 1956-1983 | 12 | 16 | 22.2 | .8 | 66 | 2.0 |
| Mexico | 1956-1983 | 2 | 21 | 13.9 | .5 | -9 | -.3 |
| Nicaragua | 1974-1983 | 7 | 6 | -6.9 | -.7 | -68 | -6.8 |
| Peru | 1956-1983 | 4 | 18 | 335.5 | 11.9 | 10 | .3 |
| Sierra Leone | 1956-1983 | 10 | 16 | .2 | .0 | -10 | -3.0 |
| Somalia | 1956-1983 | 12 | 10 | 4.9 | .2 | -64 | -2.0 |
| Turkey | 1956-1983 | 18 | 18 | 117.9 | 4.2 | 77 | 2.0 |
| Uruguay | 1961-1983 | 10 | 14 | 18.4 | .8 | -88 | -3.0 |
| Yugoslavia | 1956-1983 | 9 | 20 | 51.7 | 1.8 | -2 | -.1 |
| Zaire | 1956-1983 | 8 | 14 | 19.8 | .7 | 24 | .8 |
| | | 14 | | | | | |

* Foreign currency unit per U.S. dollar.

biased (understates the deviation from parity) when it is used to determine the existence of exchange risk on a long-term basis. It portrays the *average yearly* exchange risk exposure, not the *yearly average* exchange risk exposure.

For example, assume a country experiences a rapid change in relative inflation during year 1 but no adjustment is experienced in the exchange rate. In the following years, the exchange rate is adjusted on a basis consistent with the relative price level changes for each of the following years but the initial price level changes are ignored. Using the described method of determining the purchasing power parity error would indicate a small average percentage error as the number of years increases. However, the difference between the actual exchange rate and the parity exchange rate based on the cumulative changes in relative inflation could be quite large. This cumulative effect must be considered in the evaluation of long-term exchange risk exposure.

As previous evidence indicates,⁸ the actual adjustment to parity may not occur in a single year but may take place over a number of years. In instances such as this, one must consider the cumulative relative price level changes rather than the price level changes in each individual year. The exchange risk for a long-term asset should be measured over the total life of the asset, and it should portray the difference between the actual exchange rate and the parity exchange rate computed as if the exchange rate is appropriately and completely adjusted each year. Accordingly, the parity exchange rate to be used in the evaluation of long-term exchange risk exposure should be computed as:

$$E_{t-1}^* \times (1 + I_f)/(1 + I_d) \quad (2)$$

where E_{t-1}^* is the implied parity exchange rate at the end of the previous year, I_f is the current year consumer price level change for the foreign country, and I_d is the current year consumer price level change in the United States. The parity error is computed as previously described. This parity error computation provides a measure of the cumulative long-term error that exists throughout the period of analysis. Failure of the exchange rate to adjust completely in one year (for the price level changes in that year) is carried through multiple years until a catch-up adjustment may occur. If no catch-up adjustment occurs, the parity errors of

⁸ Lee, *Purchasing Power Parity*, and Officer, *Purchasing Power Parity and Exchange Rates*.

previous periods remain in the error computation, and the measure is appropriate for the analysis of long-run exchange risk exposure.

The parity error is recomputed for all eighteen countries using the cumulative parity approach. The results of this analysis, provided in Exhibit 5, differ considerably from the previous findings.

In most of the hyper-inflationary countries, a significant difference is observed (both yearly and on a cumulative basis) between the actual exchange rate and the parity exchange rate. Of the eighteen countries, fifteen experience an average percentage parity error greater than 10 percent. The countries in which the average percentage parity error is greater than 10 percent include Argentina, Bolivia, Brazil, Chile, Costa Rica, Ghana, Iceland, Israel, Mexico, Nicaragua, Somalia, Turkey, Uruguay, Yugoslavia, and Zaire. These results indicate that the PPP theory is much less valid when cumulative inflation effects are considered. Only three countries can be classified as not being exposed to exchange risk over the period of analysis: Bangladesh, Peru, and Sierra Leone.

In addition, many of the countries experience a systematic favorable or unfavorable long-run exchange risk exposure over the analysis period. Of the fifteen countries in which a significant average percentage parity error is observed, seven experience a negative systematic average parity error: Argentina, Ghana, Mexico, Nicaragua, Somalia, Uruguay, and Yugoslavia. This situation (negative parity errors) occurs when the actual exchange rate for the domestic currency to the U.S. dollar is less than the implied purchasing power exchange rate. This leads to a favorable exchange risk exposure situation, assuming that the price level in the foreign country of the fixed asset rises at the inflation rate. The relative price level of the asset rises faster than the exchange rate, and the MNC actually prospers from the situation.

Eight of the countries have a systematically positive parity error over the period of analysis. In these countries, the actual exchange rate of the foreign currency for U.S. dollars is greater than that implied by the PPP theorem. The actual exchange rate increases more rapidly than the relative price level. In this case, the multinational corporation is exposed to unfavorable exchange risk. The countries in which the evidence indicates systematic unfavorable exchange risk include Bolivia, Brazil, Chile, Costa Rica, Iceland, Israel, Turkey, and Zaire. A summary of the exchange risk exposure for all eighteen countries is provided in Exhibit 6.

Countries in which the long-run cumulative validity of the PPP theorem is suspect are not accurately portraying economic reality

Exhibit 5. Summary of Computed Parity Errors Based on a Cumulative Parity Adjustment

| Country | Years of analysis | Number of years with | | Parity error* | | Parity error (%) | |
|--------------|-------------------|----------------------|-----------------|---------------|----------|------------------|---------|
| | | Positive errors | Negative errors | Cumulative | Average | Cumulative | Average |
| Argentina | 1956-1982 | 1 | 26 | -37,095.1 | -1,324.8 | -4,507 | -166.0 |
| Bangladesh | 1973-1983 | 3 | 8 | .1 | .0 | -97 | -8.0 |
| Bolivia | 1956-1983 | 28 | 0 | 974.5 | 34.8 | 2,403 | 85.0 |
| Brazil | 1956-1983 | 26 | 2 | 859.6 | 30.7 | 618 | 22.0 |
| Chile | 1965-1983 | 18 | 1 | 229.2 | 12.1 | 827 | 43.0 |
| Costa Rica | 1956-1983 | 28 | 0 | 102.6 | 3.7 | 550 | 19.0 |
| Ghana | 1956-1983 | 4 | 24 | -146.3 | -5.2 | -4,261 | -152.0 |
| Iceland | 1956-1983 | 24 | 4 | 38.6 | 1.4 | 916 | 32.0 |
| Israel | 1956-1983 | 22 | 6 | 86.3 | 3.1 | 565 | 20.0 |
| Mexico | 1956-1983 | 2 | 26 | -29.0 | -1.0 | -545 | -19.0 |
| Nicaragua | 1974-1983 | 3 | 7 | -15.9 | -1.6 | -158 | -15.8 |
| Peru | 1956-1983 | 10 | 18 | 824.1 | 29.4 | -258 | -9.0 |
| Sierra Leone | 1956-1983 | 6 | 22 | -1.1 | -0 | -129 | -4.0 |
| Somalia | 1956-1983 | 1 | 27 | -95.7 | -3.4 | 1,294 | -46.0 |
| Turkey | 1956-1983 | 26 | 2 | 584.9 | 20.9 | 1,177 | 42.0 |
| Uruguay | 1961-1983 | 5 | 18 | -40.6 | -1.8 | -517 | -22.0 |
| Yugoslavia | 1956-1983 | 27 | 1 | -163.6 | -5.8 | -1,031 | -36.0 |
| Zaire | 1956-1983 | 28 | 0 | 36.5 | 1.3 | 1,354 | 48.0 |

* Foreign currency unit per U.S. dollar.

Exhibit 6. Hyper-Inflationary Countries and the Exposure to Long-Run Exchange Risk

| Insignificant exposure | Favorable exposure | Unfavorable exposure |
|------------------------|--------------------|----------------------|
| Bangladesh | Argentina | Bolivia |
| Peru | Ghana | Brazil |
| Sierra Leone | Mexico | Chile |
| | Nicaragua | Costa Rica |
| | Somalia | Iceland |
| | Uruguay | Israel |
| | Yugoslavia | Turkey |
| | | Zaire |

in their balance sheets. Through valuation of a foreign subsidiary's fixed assets at the historical cost and historical exchange rate, exposure to exchange risk is completely ignored, and the asset's value may be systematically overstated or understated.

SUMMARY AND CONCLUSIONS

Using a cumulative perspective regarding price level changes and the purchasing power parity theorem to measure the parity exchange rate error, this paper provides evidence which does not support the concept that fixed assets of subsidiaries operating in hyper-inflationary countries are not exposed to exchange risk. For most hyper-inflationary countries, there is a large deviation between the actual exchange rate and an implied exchange rate that considers previous price level changes. Exposure to exchange risk exists for fifteen of the eighteen countries which meet the hyper-inflation criterion of SFAS No. 52. Seven of the countries have a favorable exchange risk exposure since the actual exchange rate is less than the implied parity exchange rate. Unfavorable exchange exposure, when the actual exchange rate is greater than the implied parity rate, occurs in eight of the hyper-inflationary countries.

These results contradict the findings of Aliber and Stickney⁹ and imply that the reporting requirements of SFAS No. 52 fail to consider exchange risk exposure in hyper-inflationary countries. To the extent that exchange risk exposure exists in non-hyper-inflationary countries, the results of this study are generalizable to other foreign (non-hyper-inflationary) countries. The use of historical costs and historical exchange rates in financial reporting of fixed assets ignores exchange risk exposure and leads to misvaluation of non-monetary items on the statement of financial position.

⁹ Aliber and Stickney, "Accounting Measures."

The Functional Utility of Resale Price Accounting

R. J. CHAMBERS*

This paper presents the outcome of inquiries made in the expectation of clarifying the relationship to judgment and action of some ideas and magnitudes common in accounting discourse and practice. It is commonly held that the information yielded or to be yielded by accounting processes should be useful. Beyond that point, however, there has been widespread debate concerning the money amounts representing assets that are useful as elements of periodical balance sheets and income statements, and in what ways the individual amounts and aggregates of them are useful have generally been left in doubt.

The inquiries were made by mailed questionnaire. Substantially similar questionnaires were used during 1980 to 1982 in Australia, Canada, New Zealand, South Africa, and the United States. They yielded 4,932 usable responses. The authors, dates of surveys, and publication information of the results are listed in the Appendix.

BACKGROUND

The prices of goods and services are signals to consumers, merchants, and producers of the existence and prospect of opportunities for trade. Whether a person as consumer or a business firm as producer or trader can take advantage of any such opportunity depends on the command from time to time of cash and things convertible to cash by sale, and the extent of debts to others. Persons and firms having a variety of possessions — money, goods, and rights to receive money — may, as new prospects attract their

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attention, consider selectively the money they owe, the money they possess, and the non-money possessions they could sell to avail themselves of singular opportunities. Only on rare occasions may they consider the *aggregate* of the money equivalents of their assets, the money they possess, and what other possessions would fetch if sold, for example, when a major change in asset holdings is contemplated, or when substantial debt (in relation to asset holdings) has been or is soon to be incurred. Since any one or any combination of non-cash assets may be sold to make any change in asset holdings, however, knowledge of the values in exchange of those assets is, in principle, a prerequisite to choice from among the opportunities available.

The relationship between the aggregate amounts of assets, debts, and residual interests in assets of any party may be described as financial position. The balance sheets of business firms have the appearance of representing those assets and interests. A long line of practitioners, academics, and judges have held that balance sheets do, or should, represent financial positions. Balance sheets are commonly described as, or accepted as, representing financial positions. However, seldom do textbooks and the more scholarly literature of accounting or finance develop well-formed concepts of financial position, wealth, and income. Consequently, many ways of determining the amounts by which assets and equities are represented in balance sheets have been used in practice or advanced by proponents of systems claimed to be superior to traditional practice. The values in exchange or money equivalents have been accepted in all these cases for cash, receivables, and payables. But only under one proposal — continuously contemporary accounting (CoCoA) — has the consistent and systematic use of those values been upheld.

A symposium organized by Professor R. Sterling, held at Rice University in 1978, was intended to explore the possibility of reaching "agreement on a core theory of accounting." The participants included advocates of all the main modes of periodical asset valuation. The brief to participants stipulated that they should deal with the accounting for a simplified company having only two classes of assets, cash and depreciable taxicabs. Attention would thus be focused on the accounting for cash, on which there is widespread agreement, and on the accounting for a representative non-cash asset, on which there is equally widespread disagreement. Ross Skinner, who provided the closing "synthesis," found little in common among the contributions as a whole. The present author's

paper advanced the use of values in exchange or dated money equivalents as the general principle of periodical asset valuation. Of that paper, "The Taxi Company under CoCoA," Skinner said: ". . . we still need empirical substantiation of the Chambers premise. In fact, I suspect that the reason Chambers' model has not won widespread acceptance is the lack of intuitive appeal of his premise."¹ That model had supposed, to the contrary, that the use of resale prices for the representation of financial position would have immediate intuitive appeal to all who buy and sell and borrow and lend, for the choice that gives rise to every such action is predicated on the cash available, or accessible by the sale of non-cash assets, to the actor. The premise seemed to be "empirically substantiated" by the most common experiences of a money economy. However, that supposition may have been mistaken. Many things taken for granted are in need of questioning.

This author has always preferred observation at a distance from what is observed to the use of contrived experiments and questionnaires as sources of evidence in support or refutation of beliefs. In *Securities and Obscurities*,² a large number of observed and reported events and dicta were held to be supportive of the functional utility of the products of continuously contemporary accounting. However, if commercial, financial, and accounting events were not acceptable as "empirical substantiation," perhaps inquiry by questionnaire would clarify the matter, one way or the other.

Certain conditions had to be met. Whether any rule for quantifying assets yields serviceable information is made most clearly evident in commonly experienced circumstances. Some use had therefore to be made of simple but common problem situations as test items. Terms descriptive of accounting ideas, processes, or systems may evoke vocationally conditioned responses. Their use was minimized. A number of methods of quantifying assets were tested, separately and comparatively, but in a limited variety to avoid confusion at the points of response and analysis. Attention was confined to asset valuation on the historical cost, replacement or current cost, and resale price or value in exchange rules. Ambiguity in test material and ambivalence in responses were not altogether avoidable in single questionnaire inquiries. Some ques-

¹ Robert R. Sterling and Arthur L. Thomas, eds., *Accounting for a Simplified Firm Owning Depreciable Assets* (Houston: Scholars Book, 1979), 359.

² R. J. Chambers, republished as *Accounting in Disarray* (New York: Garland Publishing, 1982).

tions of similar purport, phrased in slightly different terms, could be used to check their occurrence. Experiments and surveys are expected by their designers to clarify matters in doubt or debate, but test material should be devised to avoid leading respondents in any one of the directions in debate. Some balance in question content and haphazard arrangement of questions in the questionnaire might achieve this. Because the matter at issue was the usefulness of information, in bits and in aggregates, questions dealing with components and with aggregates should be included. In case knowledge of the author's association with the inquiries might influence responses, the source and return destination of questionnaires were shown as a research or educational establishment in all cases.

A series of questions similar to those characterized here was tested at a small academic conference in Los Angeles in July 1979. It revealed a tendency to give responses qualified by caveats and provisos. Any simple question can be made complicated, and its object may be aborted by the introduction of conditions or additional premises at the respondent's option. The questionnaire used in the principal studies directed respondents to make no assumptions other than those explicitly stated in the questions.

The pilot test also revealed internal inconsistencies in individual responses. Members of a group having different theoretical commitments might be expected to respond quite differently to some of the questions. But it was not expected that members of such a group would give logically contradictory responses to related questions. On the other hand, both the literature and the practice of accounting tolerate inconsistencies. Adding an amount of cash (balance-dated general purchasing power) to the price of a non-cash asset (differently dated general purchasing power) in a dated balance sheet is an example. Whether a larger and different sample of respondents would exhibit similar inconsistencies was unknown. To discover that would be an interesting by-product of the exercise. The general style of the pilot questionnaire was retained.

The Australian survey, intended initially to be the only one, was conducted in early 1980. The questions were in such a general form, however, that they could be answered by accountants and non-accountants and, with minor alterations, by respondents in any economy having commercial practices and financial publicity laws similar in purport to those in Australia. In mid-1980, and in the light of the Australian results, the survey was replicated in

Canada, New Zealand, South Africa, the United Kingdom, and the United States. The U.K. survey was later abandoned for lack of financial support.

SAMPLE COMPOSITION

A "fairly large" sample was sought of persons qualified as accountants and of other persons who, by profession or occupation or other experience, might be expected to use financial magnitudes appearing in the products of accounting processes. The two major groups were considered likely to give similar responses on the usefulness of specific items of information but might entertain different ideas about such aggregates as income or profit, financial position, and wealth. The professional training of accountants, their vocational preoccupation with traditional accounting rules, and their familiarity with the debate over alternative styles of accounting might cause such differences. The sample, therefore, was designed to include a substantial number of qualified accountants and other people. Among the others were practitioners in the financial, legal, medical, veterinary and engineering professions, business executives, and, in two countries, a number of workers' union officials.

Mailing lists were stratified to secure fairly large subsamples of accountants and others. Professional and other directories were used. Names were selected haphazardly; but because directories are usually selective (what could be used depended on what was available and the willingness of addressees to cooperate could not be known), the mailing lists could not be described as random samples or as representative of specific professions, trades, or callings. The mailing lists and the responses could be said to include a broad spectrum of individuals who, as business people or investors on their own account, would have some practical knowledge of financial matters. That would suffice; the inquiry was to be exploratory of common understandings, not exploratory of the differences between the understandings of different classes of person. By "fairly large," used with reference to samples and subsamples, nothing stronger was or is intended than that the respondents should be a nontrivial number of persons representing some of the diversity of the population of the community at large. The compositions of the samples and of the aggregate of samples are given in Exhibit 1.

Response rates varied between countries and subsamples in each country. For each country, the responses were at least as good as,

Exhibit 1. Sample Compositions — Five Countries

| | Aus- tralia | Canada | New Zealand | South Africa | United States | Total |
|--------------------------------------|----------------|--------|----------------|-----------------|------------------|-------|
| Effective mailing | 1,944 | 2,251 | 1,000 | 2,017 | 1,835 | 9,047 |
| Usable responses | 1,126 | 1,236 | 677 | 1,065 | 828 | 4,932 |
| Response rate (percent) | 58 | 55 | 68 | 53 | 45 | 55 |
| Composition of respondents (percent) | | | | | | |
| Accountants | 66 | 52 | 69 | 48 | 26 | 49 |
| Bankers and financiers | 9 | 7 | 9 | 12 | — | 8 |
| Economists | — | — | — | — | 20 | 3 |
| Legal practitioners | 7 | 8 | 8 | 6 | 16 | 9 |
| Others | 18 | 33 | 14 | 34 | 38 | 31 |
| | 100 | 100 | 100 | 100 | 100 | 100 |

and in some cases better than, response rates reported for similar inquiries. There seemed to be nothing specific in the questionnaire that would encourage recipients not to respond. As a mild inducement, the Canadian inquiry offered respondents a summary of the raw results; the Canadian response rate was no better than the average of the other surveys. The general indifference of many people to inquiries by mail is all that can be offered as an explanation of failure to respond.

THE QUESTIONNAIRE

Some of the questions detailed simple problem situations in which knowledge of some money amount is necessary and certain kinds of amounts were given. Others sought to elicit what respondents would regard as, or include in the calculation of, wealth, financial position, and income; some gave quantified examples; others gave verbal options. On the advice of a specialist in sample surveys, respondents were provided with two options (yes/no) in most cases. The following are examples; the identifying symbols correspond with those used in Exhibit 2.

W1 If you have \$1,000 in the bank and 100 company shares for which you paid \$1,500 three years ago, and you have no other property, would the sum of these amounts (\$2,500) indicate how much money is at your disposal now?

Yes..... 1

No..... 2

W8 Do you think your financial position would be best represented by the relationship between:

Exhibit 2. Wealth, Financial Position, and Spending Power
(Percentages of analytically expected responses — AER)

| | AER | Aus- tralia | Canada | New Zealand | South Africa | United States |
|---|-----|----------------|--------|----------------|-----------------|------------------|
| W1 Is <i>spending power</i> indicated by the cost of an asset? | No | 97 | 96 | 96 | 96 | 97 |
| W2 Is <i>spending power</i> indicated by the replacement cost of an asset? | No | 62* | 84 | 95 | 90 | 90 |
| W3 Is <i>wealth</i> indicated by the un-amortized cost of an asset? | No | 95 | 91 | 96 | 94 | 93 |
| W4 Are amounts of assets indicative of <i>debt paying or spending power</i> ? | Yes | 23* | 56 | 59 | 56 | 46 |
| W5 Does present <i>wealth</i> include expected proceeds of the use of assets? | No | 97 | 97 | — | — | — |
| W6 Does present <i>wealth</i> depend on expectations of the future? | No | 85 | — | 80 | 90 | 79 |
| W7 Is <i>wealth</i> indicated by the sum of cash holdings and (a) the cost of assets? or (b) the selling prices of liquid assets and the buying prices of durable assets? or (c) the selling prices of non-cash assets? | (c) | 93 | 91 | 91 | 90 | 89 |
| W8 Is <i>financial position</i> best indicated by using for assets (a) what possessions would fetch if sold? or (b) the prices paid for non-cash assets? or (c) the purchase prices of non-cash assets? | (a) | 83 | 82 | 83 | 78 | 83 |
| W9 Is a person insolvent whose immediate debts exceed the <i>worth</i> of assets? | Yes | 69 | 62 | 86 | 71 | 60 |

* The Australian (earliest) form of the question was subsequently made more precise.

- (a) what you owe (your debts), and the total of all your money and the amount your other possessions would fetch if they were sold? 1
- or (b) what you owe (your debts), and the total of all your money and the prices paid for your other possessions? 2
- or (c) what you owe (your debts), and the total of all your money and what you would have to pay to buy your possessions if you did not already have them? 3

Collaborators in the replications were given a modest amount of freedom to vary the details of the questions, to be consistent with local currencies and prices; to vary the composition of the questionnaire; and to vary the composition of the sample. Some questions were included in only some of the surveys, hence the blanks in Exhibits 2 and 4. But the key questions, on wealth and financial position, and significant words were used throughout. The general coverage of the questionnaire was substantially the same in all cases.

The questions were divided almost equally into two groups, one relating to wealth, financial position, and spending power, the other to income and changes in wealth. The terms "wealth," "financial position," "spending power," "gain," "loss," and "better off" were used as having more or less common interpretations. If this assumption were erroneous, the error would become apparent in the responses. The word "value" was not used; its many possible meanings would have been a source of vexatious ambiguity. Similarly, "worth" was used sparingly. "Assets" was used only once. As indicated earlier, the object of using terms that might be readily and commonly interpreted was to avoid the possibility of confusion that might arise from the use of terms of art. The wealth-oriented and income-oriented questions were spread randomly through the questionnaire, so that respondents would be obliged to consider each question anew.

INTERPRETATION

The absence of a coherent set of ideas linking financial magnitudes with judgment and action would cause the responses to each of the questions to be unrelated. Responses to a question relating to spending power could not be connected in any way with responses to a question on wealth, or financial position, or income, for example. However, a coherent set of ideas may be developed for the term "spending power." In a market economy, the capacity of any party to engage in transactions with others depends on access to spending power. Spending power is signified by holdings of money and of other things having value in exchange. In a credit economy, it depends also on the debt situation of the party. The liquidation of debts is a commitment of spending power. Spending power is augmented by income-earning operations, the sale of services by persons, or the trade in goods and services by firms. Every party whose means are scarce relative to wants will choose, among optional transactions within accessible spending power, that

or those expected to yield the greatest advantage or the least disadvantage at some subsequent time. Expected advantage includes expected spending power. To choose to advantage depends, among other things, on knowledge of accessible spending power and debts from time to time, and the rate at which net spending power has increased or diminished between such times.

In this plan, spending power (the values in exchange of possessions), financial position (the capacity to engage in transactions by virtue of exchangeable possessions and debts), wealth (the spending power represented by exchangeable possessions net of debt), and income (the periodical increment or decrement in wealth) are integrally related ideas. The amounts that represent them are integrally related amounts. Given the conditions stipulated — interpersonal exchange at money prices, credit, and scarcity of means — to any concept of wealth there is a corresponding concept of income.

In preparing the questionnaire, there could not be, and there was not, any presumption that respondents would adopt or endorse any specific concept of wealth. That was to be discovered. Whether in addition to the concept of wealth endorsed by any respondent there would be a corresponding concept of income was also to be discovered. In analyzing responses, it would be convenient to have a self-consistent set of ideas that might be used as a standard or yardstick. It was supposed to be intuitively obvious that spending depends on spending power. The above set of ideas linking spending power with financial position, wealth, and income could serve as a means of analyzing responses. To every question of substance, then, there corresponds a response that may be described as “expected on analytical grounds,” a unique response that can be shown to be a necessary premise of choice on grounds related to the logic of choice in financial matters. The raw data would thus yield distributions of responses, the frequency of analytically expected responses, and, by cross-tabulation of responses to similar or related questions, an indication of the consistency of ideas entertained by respondents or deducible from responses.

The results are presented in Exhibits 2 and 4. In those tables, the forms of the questions are digests closely representing the purport of the questions used. The words and phrases emphasized in the tables identify the principal reference of each question. Generally, those exact words were used in the questions, but of course without the emphasis. The arrangement of the questions is orderly; the arrangement in the questionnaires was random.

WEALTH, FINANCIAL POSITION, AND SPENDING POWER (EXHIBIT 2)

The questions provided the opportunity to consider a variety of ways to estimate wealth, financial position, and spending power — past costs, replacement costs, expected proceeds of use, and the selling prices, of assets. The substantial proportions of negative responses to questions W1, W2, W3, W5, and W6 signified a general rejection of initial costs, replacement costs, and expected proceeds, taken singly, as estimators of spending power and wealth. When, in questions W7 and W8, relating to aggregate wealth and financial position, three optional values for assets were offered, substantial proportions of respondents indicated that the selling prices of assets were the appropriate means of quantifying assets. The conjunction of these two sets of responses gives grounds for supposing that the money equivalents of assets — the amount of cash and the selling prices of non-cash assets — are considered to be magnitudes relevant to financial choices and judgments as against other magnitudes for possessions at a given date.

Of interest, furthermore, is that these majority responses corresponded in all cases with the analytically expected responses. In effect, this confirmed the suppositions on which the analytically expected responses were based. The responses to questions W4 and W9 were, in aggregate, in keeping with the analytically expected responses, but to a less decisive extent. The word “assets” was used only in W4, and “worth” was used only in W9: both questions alluded to the relationship between amounts of assets and amounts of debt. However, the substantial majorities of analytically expected responses to the other questions taken singly mask some anomalies. Of the five exercises, the Australian and Canadian data were the most intensively examined; but from the general similarity of responses, there seems to be no ground for expecting the other surveys to differ. Questions W7 (“wealth”) and W8 (“financial position”) were intended as cross-checks. Both yielded substantial majorities in favor of the use of resale prices or money equivalents. But for the two questions together, quite a number of individuals gave inconsistent responses (see Exhibit 3). Other anomalies are apparent from the data of Exhibit 2. Spending power was said to be associated with asset costs by 3 to 4 percent of respondents (W1). Replacement cost was said to be associated with spending power by a non-negligible minority.

INCOME AND CHANGES IN WEALTH (EXHIBIT 4)

The questions on income and changes in wealth were expected to indicate what is commonly understood by income and whether its common understanding is consistent with what is understood by

Exhibit 3. Wealth and Financial Position: Money Equivalent Responses

| | Australia | | Canada | |
|-------------------------|-----------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Wealth (W7) | 1,041 | 93 | 1,121 | 91 |
| Financial position (W8) | 935 | 83 | 1,009 | 82 |
| Both (i.e., consistent) | 889 | 79 | 955 | 77 |
| Total responses | 1,126 | 100 | 1,236 | 100 |

**Exhibit 4. Income and Changes in Wealth
(Percentages of analytically expected responses — AER)**

| | | Aus- AER | tralia | Canada | New Zealand | South Africa | United States |
|-----|---|-------------|--------|--------|----------------|-----------------|------------------|
| Y1 | Is the difference between a purchase price and a higher price obtained on sale of an asset a <i>gain</i> ? | Yes | — | 77 | 66 | — | — |
| Y2 | Is the difference between a purchase price and a lower price obtained on sale a <i>loss</i> ? | Yes | — | 80 | — | — | — |
| Y3 | Does a fall in the price of an asset represent a <i>loss</i> ? | Yes | 33 | 56 | 53 | 37 | 49 |
| Y4 | Is <i>income from an investment</i> the difference between dividends received and a fall in the selling price of an asset held? | Yes | — | — | 35 | 24 | 37 |
| Y5 | Is one <i>better off</i> by the amount of a rise in the price of an asset held? | Yes | — | 58 | 61 | 49 | 66 |
| Y6 | Does <i>wealth</i> decrease by the amount of a fall in the price of an asset held? | Yes | — | — | 91 | 84 | 88 |
| Y7 | Does <i>profit</i> imply a corresponding increase in wealth? | Yes | — | 60 | — | — | — |
| Y8 | Does <i>profit</i> imply a corresponding increase in spending power? | Yes | 16 | — | 21 | 25 | 25 |
| Y9 | Is the effect of inflation on a fixed nominal amount of assets to <i>reduce wealth</i> ? | Yes | 92 | 93 | 92 | 93 | 87 |
| Y10 | Is one <i>better off</i> consequent upon using a less costly rather than a more costly unit of a homogeneous stock? | No | 98 | 96 | 97 | 97 | 94 |

wealth. Since the greater part of accounting practice deals with *business* income, and since the greater part of accounting debate is concerned with what shall be included in business income

calculation, questions were framed principally with reference to one class of investment for income, company shares. It seems likely that the types of individuals who would be respondents would have had some experience of investing in securities or of dealing with the security investments of others. Further, there is a known source of share prices, so that accrued gains or losses on share holdings could be readily determined.

As indicated earlier, under the plan by which the analytically expected responses were determined, wealth and income are integrally related. That income is an increment in wealth has been explicitly endorsed by many writers on accounting. Further, it is implicit in the processes of double-entry bookkeeping, for whether income is computed as a difference between dated statement of wealth, or balance sheet amounts are residuals consequential from the calculation of income in other ways, the derivation of one entails the magnitude of the other. Under the conditions stipulated — interpersonal exchange at money prices, credit, and scarcity of means — it might have been expected that responses to the questions summarized in Exhibit 4 would reflect the same (high or low) degree of correspondence with analytically expected responses as those of Exhibit 2.

It turned out not to be the case. In the earlier surveys (Australia, South Africa, United States), it was taken for granted that a realized difference between a purchase price and a selling price would be regarded as a gain or a loss. When such questions were later asked (Y1 and Y2 of Exhibit 4), unexpected minorities responded otherwise. If wealth is properly estimated by reference to what assets would fetch if sold (see the large majority response to question W7 of Exhibit 2), rises and falls in the prices of assets still in possession might be expected to be included, by a corresponding majority, as gains or losses in income calculation. The responses to questions Y3, Y4, and Y5 did not show such a majority. The result was materially better when a fall in price was related to wealth (Y6). Responses to questions relating profit to wealth and spending power (Y7, Y8) were widely divergent from expectations.

Two other rather different questions constituted the set. A large proportion of respondents considered the effect of inflation on asset holdings to be a reduction in wealth (Y9). Question Y10 was expected to indicate whether respondents had any common response to a situation in which cost-flow assumptions (such as FIFO and LIFO) are widely used in accounting. In the case of a

homogeneous stock, which unit of those bought at different prices is used first has no bearing on subsequent "well-offness." A large proportion of respondents held that opinion.

SOME GENERAL INFERENCES

The substantial similarity of responses, across five countries in many cases, may have been expected. The countries surveyed have substantially similar laws, understandings, and practices in commercial and financial matters, and the types of individuals whose responses were sought would be likely to have had substantially similar experiences in personal and commercial financial arrangements. As indicated earlier, it was initially supposed that accountants as a class might have responded differently to some questions than other persons, due to their training and vocational conditioning, but that supposition seems to have been mistaken. Exhibit 5 presents the responses of accountants to certain questions. These percentages are approximately the same as those for the entire samples reported in Exhibits 2 and 4. Confronted with problem situations or with questions without allusion to accounting practices, accountants seemed to differ in no substantial way from the other groups in the samples. In particular, for the five countries, there was the same general rejection of replacement cost (W2) and unamortized cost (W3), and endorsement of selling prices (W8), in the situations specified, contrary to widely held opinions and practices.

Some general features of the questionnaires and responses deserve closer attention. Almost all of the questions that specifically used the terms "wealth," "financial position," and "spending power" yielded high proportions of analytically expected responses (W1, W2, W3, W5, W6, W7, W8, Y6, Y9, Y10). Almost all of the

Exhibit 5. Percentage of Analytically Expected Responses of Accountants to Selected Questions

| | Australia | Canada | New Zealand | South Africa | United States |
|-----------------------|-----------|--------|-------------|--------------|---------------|
| Number of respondents | 748 | 641 | 468 | 510 | 212 |
| Question W2 | 62* | 86 | 93 | 89 | 92 |
| W3 | 96 | 94 | 97 | 95 | 91 |
| W6 | 87 | — | 80 | 90 | 82 |
| W8 | 82 | 80 | 81 | 81 | 81 |
| W9 | 71 | 64 | 89 | 73 | 66 |
| Y3 | 32 | 51 | 55 | 38 | 42 |

* Earliest form of a question was later rephrased more precisely.

questions that used the terms "gain," "loss," "income," and "profit" yielded lower, and in some cases much lower, proportions of analytically expected responses (Y1, Y2, Y3, Y4, Y7, Y8). In addition, in all surveys, there were minorities, both of accountants and non-accountants, who held such notions as the cost of a security three years ago is indicative of present spending power; the difference between the purchase price and the realized sale price of an asset is not a gain or a loss, as the case may be; and inflation has no bearing on the wealth represented by an earlier dated money sum.

These minor oddities and the marked difference in responses to wealth-oriented and income-oriented questions suggest that the respondents did not hold as clear and systematic an idea of the relationship between wealth and income as may be necessary for analytical or prescriptive rigor. That may have been anticipated. Accounting textbooks, handbooks, standards, and practice display great tolerance for diversity and inconsistency in what is represented as wealth and income. Non-accountants having experience of accounting and its products would have been subject to the same influence.

The high proportions of analytically expected responses to wealth-oriented questions are not explicable in the same terms. The traditional method of representing financial position and wealth ("shareholders' funds" is the common description) is by a balance sheet in which non-monetary assets are valued at their costs or unamortized costs, and most of the discussion of alternatives has focused on some variety of replacement costs or discounted proceeds of use and sale. All of these modes of asset quantification were rejected by large majorities of respondents; large majorities endorsed "what possessions would fetch if sold" (resale prices or money equivalents). For accountants and non-accountants, those majorities were of the same magnitude. The responses suggest, further, that wealth, financial position and spending power are considered to be closely related concepts; questions using each of those terms generally yielded high percentages of analytically expected responses. Respondents appeared to have held clearer and more exact ideas of wealth and changes in wealth than of gain, loss, profit, and income.

There is a plausible explanation. Buying and selling and borrowing and lending are much more frequent experiences than income calculation. Any party contemplating one or more of these actions on a non-trivial scale must ask, "How much money do I

now have access to by virtue of my present possessions and debts?" The same question would be asked by any party considering whether present income is or is not adequate to make feasible some future action, and by any party who wishes to know on what scale a present rate of income must be augmented or may be reduced. The answer to the question is necessarily a spendable sum, of cash in hand and what could be raised by disposing of non-cash assets. Far less frequently is income of a period calculated; thus, far less frequently is the possibility of a connection between income and wealth considered by individuals. The most common experience of income calculation by individuals is for the purpose of income tax assessment, and generally for that purpose, accrued gains and losses (the subject of questions Y3 and Y4) are disregarded. Further, the answer to the question "What is my income?" asked at any other time will inevitably be vague. People such as those who were respondents commonly have more than one source of income. Some income may be subject to deductions at the source. Income from property may be auxiliary income for which no more precise estimate is necessary than is given by cash received. In short, a cash-flow concept of income may often be convenient and sufficient, even to those who would accrue shifts in the prices of assets when estimating wealth.

In the circumstances, indeed, the third of the conditions under which observation would be expected to correspond with the model of informed action — namely scarcity of means — is not satisfied. A person whose stock of means (assets) or whose income provides a buffer against want is not impelled to keep the employment of the stock and the income it yields under anxious scrutiny. The types of person who constituted the samples in these surveys are likely to fall within the description. To professional and salaried income earners, income from property may be a welcome supplement, not an economic necessity. Investment in securities or other property may be chosen on the maximizing principle, but by reason of the uncertainty of investment outcomes, the costs of transactions and the auxiliary nature of property incomes, those investments may be subjected to only occasional reconsideration.

SOME CONCLUSIONS

On the basis of data, such as those of Exhibit 3, at least three of four, and possibly a much higher proportion, of the respondents would *not* be misled by a statement of wealth or financial position

in terms of the values in exchange of assets, and *would* be misled by a statement that quantified assets in other ways. There is no such clear indication regarding income or income calculation from the responses. Though the previous section offered some speculative explanation of the inconsistencies in the individual responses, and of the mass divergence of some responses from what was analytically expected, responses to income-oriented questions give no direct guidance to an ideally informative concept or measure of income. Respondents may have entertained loose or ambiguous ideas as to the relationship between income and wealth as of a particular time in respect of personal affairs. Most of the problem situations specified in the questions were of the nature of personal problem situations. No such vagueness is tolerable, however, in accounting for business firms or for the information of parties financially interested in them.

Business firms are perennially at the risk of the impact, on spending power, financial position, and income, of innovation, obsolescence, competition, and changes in tastes. The impact on any firm is no different in principle or effect whether it arises from trading gains and losses or from changes in the money equivalents of durable or other goods while in a firm's possession. To actual or prospective changes in the prices of assets, senior executives and subordinate buying, selling, and processing executives may react, remedially or aggressively, but only if the means of doing so are, and are known to be, at the firm's disposal, and only to the extent that doing so will not adversely affect the firm's financial position in other ways. Prompt and coordinated action to sustain profits and maintain solvency depends on sensitive and current indicators of the firm's access to spending and debt-paying power, and the rate of growth of net spending power, from time to time. Unless the rate of return, a key indicator of financial success, is the ratio of a dated increment in net spending power to a dated amount of net spending power, it bears no relationship to the grounds and circumstances of a firm's decisions and actions.

Substantially, the same reasoning applies to external parties entitled to receive periodical financial statements. The laws relating to financial publicity are intended to enable outsiders to judge in their own interests the amount and the reliability of the spending power they may receive by way of interest or dividends. That judgment cannot reasonably be made unless what is reported as a periodical result is the periodical increment in spending power.

Nor can judgments reasonably be made of a firm's solvency, leverage, asset composition, and debt-dependence from time to time unless the components of these indicators are expressed in dated amounts of spending or debt-paying power. Except for the laws relating to corporate financial publicity, no contractual provision for the supply of financial information to creditors and their agents or trustees is of value as a signal to lenders or constraint on borrowers unless that information is of the same kind. Further, since investors and creditors may or must choose between the firms whose operations they will support, no comparative judgment is possible unless the results and positions of business firms generally are determined by recourse to the (externally ascertained) values in exchange of their assets from time to time.

Although the surveys gave no unequivocal indication of a wide endorsement of a particular method to calculate income, such a method is entailed in the large majority responses to wealth-oriented questions. Of course, under any mode of double-entry accounting, what is represented as income and what is represented by a balance sheet are simultaneously determined or mutually entailed. But under systems using asset values other than dated money equivalents, there is no specifiable and intelligible relationship between periodical aggregates and the determinants of judgment and action.

Curiously, despite the universal bearing of financial position on choice and action, its practical significance has been largely disregarded. Textbooks may mention it briefly. Formal inquiries and professional directives over the whole of their history have not attempted to elucidate it. The whole of commercial operations and much of the business of individual persons are directed to the acquisition and disposal of spending power. But the income amounts and balance sheet aggregates of systems using original cost, replacement cost, and discounted proceeds as asset valuation bases have no ostensible connection with spending power.

For the future, there is no reason to suppose that it will be proper to use asset valuation rules which, in some obvious information-use situations, are analytically irrelevant and so generally rejected by respondents to these inquiries. If accounting is to provide serviceable information in a large variety of circumstances to a large variety of information users, the evidence and argument in favor of valuing assets in financial statements at their resale prices strongly suggest its superiority to other modes of valuation.

APPENDIX

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A Case for Special Drawing Rights as a Unit of Account

PRAKASH L. DHEERIYA*

Foreign currency translation is an old problem in international accounting. Even Paciolo referred to it: "The first important duty of the book-keeper was to convert each item in the Memorial to the monetary unit in which his accounts are kept. Having made this calculation, he transcribed the entry into the Journal. . . ."¹ The absence of a single world monetary unit (or world money) makes foreign currency translation inevitable.

In the existing environment, exchange rates which constantly fluctuate make it difficult to measure the economic effects of those fluctuations for a multinational company. In some cases, the movements in the exchange rates have no bearing on the effectiveness of operations of affiliated companies in a particular country.²

This paper attempts to justify the use of a composite currency unit, such as the special drawing right (SDR), as a unit of account for transactions involving foreign currencies.³ The underlying

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The author expresses his appreciation to Dr. Robert Strand for making the IMF tapes available.

¹ Richard Brown, ed., *A History of Accounting and Accountants* (Edinburgh: T. C. & E. C. Jack, 1905), 112.

² George M. Scott, "Topical Priorities in Multinational Accounting," *Multinational Accounting: A Research Framework for the Eighties*, ed. Frederick D. S. Choi (Ann Arbor: University Research Press, 1981), 8.

³ Gunter Duffey recommends various measures for dealing with the problem of changing exchange rates. One of them is to "educate" the board, the shareholders, and security analysts as to the real effects of devaluation or revaluation. The use of SDR, too, is another method of educating the same audience. See "Corporate Finance and Exchange Rate Variations," *Financial Management* (Summer 1972), 56.

assumption is that the impact of variations in a composite currency unit on reported earnings over a period of time is much less than the impact of variations in individual exchange rates which comprise the composite currency unit. Writing on the use of SDR in international accounting is sparse. An article by Jacobi discusses the appropriateness of the SDR as a unit of account for multinational enterprises classified as geocentric, ethnocentric, and polycentric.⁴

A brief introduction to the concept of special drawing rights (SDRs) is provided to acquaint the reader with the development and status of this unique measuring unit. Statistical evidence is presented to demonstrate that the external value of the SDR is relatively more stable than that of its individual currencies. This is followed by implications of the use of the SDR as a measuring unit in international accounting. The paper concludes with the author's observations and comments.

SPECIAL DRAWING RIGHTS

The critical problem after the establishment of the Bretton Woods System was ensuring the adequate growth of official reserves (usually synonymous with international liquidity) without becoming too dependent on the dollar as a reserve currency. The danger of such dependence was that the ratio of U.S. gold reserves to dollar liabilities would become so small that confidence in the dollar would be undermined. The SDR was introduced as an attempt to reduce dependence on the dollar and upon all reserve currencies.

The SDR was initially valued against gold at 1 SDR = 0.0888671 grams of fine gold, which in 1969 was the same as the par value of the U.S. dollar. After the abandonment of the \$35-an-ounce official gold price in 1973, the SDR was valued on the basis of a weighted average of sixteen currencies⁵ whose issuers accounted for more than 1 percent of world trade in the period 1968 to 1972. From July 1974 to December 1980, the value of the SDR was determined daily by the International Monetary Fund on the basis of a basket of currencies with each currency assigned a weight

⁴ Michael H. Jacobi, "The Unit of Account in Consolidated Financial Statements of Multinational Enterprises," *International Journal of Accounting* (Spring 1980), 29-33.

⁵ These sixteen currencies with their weights in parentheses were U.S. dollar (33 percent), German mark (12.5 percent), pound sterling (9 percent), French franc (7.5 percent), Japanese yen (7.5 percent), Canadian dollar (6 percent), Italian lira (6 percent), Dutch guilder (4.5 percent), Belgian franc (3.5 percent), Swedish krona (2.5 percent), Australian dollar (1.5 percent), Danish krona (1.5 percent), Norwegian krona (1.5 percent), Spanish peseta (1.5 percent), Austrian schilling (1 percent), and South African rand (1 percent).

in the determination of that value. The market values of the currencies of the basket per unit of the U.S. dollar prevailing in the London foreign exchange market, multiplied by the relevant weights, were added to yield the rate of the SDR in terms of the U.S. dollar. The rates for the SDR in terms of other currencies were derived from the market exchange rates of these currencies for the U.S. dollar and the U.S. dollar rate for the SDR.⁶

Whenever the Fund changed the underlying structure of the SDR, it ensured that the value of the SDR in terms of any currency remained the same before and after the change. Since January 1, 1981, the SDR basket has consisted of the currencies of five countries having the largest exports of goods and services during 1975-79. The weights for the five currencies (U.S. dollar 42 percent, German mark 19 percent, French franc, Japanese yen, and pound sterling, 13 percent each) were determined to reflect the relative importance of these currencies in international trade and finance. The necessary conversion calculations from the agreed percentage weights into units of each of the five currencies in the new basket were made by using the London noon exchange rates averaged over the last quarter of 1980.

PERFORMANCE OF THE SDR

On the international level, enforcing the acceptance of a certain unit as a means of payment requires a formal agreement among governments to establish an international reserve currency. The introduction of the SDR illustrates the use of this method. The development of any monetary unit as a means of payment in international transactions may ensue from the creation of bank deposits denominated in that monetary unit. International banks may be willing to accept deposits denominated in SDRs because a potential demand for SDR funds already exists, as manifested by SDR bond issues of the Swiss Aluminum Company, the Swedish Investment Bank, and Electricite de France. In July 1975, the Bank Keyser Ullman in Geneva (a subsidiary of Keyser Ullman of London) announced that it would henceforth accept demand and time deposits denominated in SDRs. In August 1975, the Chase Manhattan Bank in New York instituted a range of banking facilities in SDRs, including loans, deposits, and futures trading.⁷

⁶ For description of the rules and regulations pertaining to valuation of SDRs, see the Appendix.

⁷ Joseph Aschheim and Y. S. Park, *Artificial Currency Units* (International Finance Section, Princeton University, 1975), 3.

The SDR's role in the current international monetary system has so far disappointed its architects. Its future role depends on the International Monetary Fund (IMF) and on the functioning or breakdown of the international financial system.

EXCHANGE RATE RISK

Exchange risk is the possibility of loss or gain resulting from a change in rate of conversion from one currency to another. In an accounting sense, exchange risk is concerned with fluctuations in real economic value and, therefore, with future cash flows. Exchange risk is the incremental variability in a firm's cash flows arising from exchange rate changes.⁸ It is very difficult to measure quantitatively the impact of variability in exchange rates on earnings.⁹ However, a *Wall Street Journal* report cites an instance where a multinational corporation suffered a decline in earnings to the extent of \$30,000 every time the German mark increased 1 percent against the dollar.¹⁰ For this analysis, the volatility of an exchange rate is measured by the standard deviation of the absolute percentage change in the exchange rate. The time frame of the study is the forty-eight-month period, January 1981 through December 1984.¹¹ The criterion for selecting a unit of measurement for reporting overseas operations is the standard deviation of the absolute percentage change in the unit of measurement (i.e., the exchange rate) over the forty-eight-month period from January 1981 to December 1984.¹² For reporting transactions involving overseas currencies, the alternative units of measurement are the SDR or any other units of foreign currency.

⁸ Ian H. Giddy, "Why It Doesn't Pay to Make a Habit of Forward Hedging," *Euromoney* (December 1976), 96.

⁹ *Ibid.*, 100.

¹⁰ *The Wall Street Journal* (December 8, 1976), 34.

¹¹ The absolute percentage change $(X(t) - X(t - 1))/X(t - 1)$ can be approximated by $\text{Log } X(t) - \text{Log } X(t - 1)$. The absolute value ensures that increases or decreases in the exchange rate are equally bad and that a percentage change equal to 2 is twice as bad as a percentage change equal to one.

¹² Note that the only relevant variable is the standard deviation of the absolute percentage change in the exchange rate and not the standard deviation of the exchange rates per se. This is because exchange rates are determined in the flexible exchange rate system; hence, variation over a period of time is acceptable. The focus of attention is on the extent of relative variability. If the fixed exchange rate system were in vogue, the standard deviation of the exchange rate (or the variability around the fixed rate), not the standard deviation of the percentage change, would be the relevant variable. Jacob A. Frenkel and Michael L. Mussa in "The Efficiency of Foreign Exchange Markets and Measures of Turbulence," *American Economic Review* (May 1980), 374, use the average value of the absolute percentage change in exchange rate as a measure of its volatility.

METHODOLOGY

Data of units of SDRs per unit of each of its currency-components were collected on a monthly basis from IMF tapes from January 1981 to December 1984. Since the exchange rate between the dollar and the dollar (or between one currency and itself) is constant (i.e., equal to one), its standard deviation will be zero for the time series of observations of forty-eight months. Hence, by the criterion of volatility, the dollar is the most appropriate currency for U.S. reports involving the dollar.¹³ What remains to be proved is that the SDR (not any other foreign currency) is the best unit of measurement for reporting operations on a global scale. The hypothesis to be tested is that the variation in SDR/\$ exchange rate is greater than or equal to the variation in exchange rates between currencies comprising the SDR.

FINDINGS

The exchange rate between the SDR and the dollar showed the least variation over the forty-eight-month period. The result cannot be generalized for the SDR denominated in any other currency. The variation of the SDR denominated in a currency other than the dollar will depend on the variation/volatility of the exchange rate between the dollar and that currency. The variation of exchange rates denominated in dollars is given in Exhibit 1.

Over the four-year period, the SDR/\$ exchange rate had a standard deviation of 0.7 percent, while the other exchange rates showed a standard deviation ranging between 1.0 to 1.63 percent. If the ratio between the variances of the German mark/\$ rate and the SDR/\$ rate (and between the other exchange rates and the SDR/\$ rate) is taken and compared with the tabulated values of the F distribution, the hypothesis that all variances are equal can be tested. In this case, the hypothesis that the variation in SDR/\$ exchange rate is greater than or equal to the variation in any other exchange rate is easily rejected at 99 percent confidence level. This result can only mean that a composite currency unit such as the SDR shows a lesser variation than that shown by each

¹³ Since data were available only in terms of dollars, the analysis has been done on exchange rates denominated in dollars. If all currencies comprising the SDR, and the SDR, were denominated in any of the currency-components of the SDR (e.g., the Japanese yen), the exchange rate having a standard deviation of zero will be the most appropriate rate for reporting purposes. In this case, the most appropriate currency for reporting purposes in Japan will be the Japanese yen, because that time series will have zero standard deviation. This result can be generalized for any currency which is a part of the SDR basket of currencies.

Exhibit 1. SDRs Denominated in Dollars

| Exchange rate | Standard deviation | Variation | F ratio | Mean* |
|------------------|--------------------|-----------|---------|------------|
| SDR/\$ | 0.00723189 | 0.0000523 | — | 0.01175765 |
| German mark/\$ | 0.01629937 | 0.0002657 | 5.275 | 0.01777445 |
| Japanese yen/\$ | 0.01089972 | 0.0001188 | 8.786 | 0.01349255 |
| British pound/\$ | 0.01575954 | 0.0002484 | 7.44 | 0.01917722 |
| French franc/\$ | 0.01540004 | 0.0002372 | 8.108 | 0.01540004 |

* This measure is used by Jacob A. Frenkel and Michael L. Mussa, "The Efficiency of Foreign Exchange Markets and Measures of Turbulence," *American Economic Review* (May 1980), 374. Their criterion is the mean value of the absolute percentage change of a data series $X(t)$ where $t = 1, 2, \dots, N$. It is defined as

$$1/N \sum_{t=1}^N | \log X(t) - \log X(t-1) |$$

Even by their measure of volatility, the SDR/\$ exchange rate is the least volatile among all other exchange rates. Their measure is not quite appropriate for this analysis, because it looks at a long-run average of an exchange rate and assumes a fixed-exchange rate system. Since multinational corporations are more interested in the daily relative variations in the exchange rate than in its long-run average, the measure of standard deviation is preferred. Even their measure indicates the superiority of the SDR/\$ exchange rate.

of its currency-components.¹⁴ A similar study can be performed to determine whether the SDR reveals less variation when it consisted of sixteen currencies (i.e., since the inception of the SDR to December 1980). Another method of testing the hypothesis would consist of the calculation of variation in reported earnings denominated in terms of SDRs of some sample companies and comparing that variation with the variation in earnings computed in terms of U.S. dollars. The results will be the same whether a macro or a micro approach is used.

The findings clearly indicate that the SDR/\$ shows less variation than the variation of its individual currency components. The domestic currency to domestic currency rate shows zero variation and is the least volatile, according to the criterion of volatility. When a multinational company begins to deal in a currency other than the domestic currency, the issue of volatility gains in importance. It is irrelevant when its operations take place in a domestic currency only. This analysis indicates that the SDR/\$ exchange rate is the least volatile when currencies other than the domestic currency are involved. It is meaningless to report financial statements in SDRs when the operations are conducted totally in a

¹⁴ Alan C. Shapiro and David P. Rutenberg also find that variance of a portfolio of five currencies is significantly below the variances of the French franc, Swiss franc, German mark, British pound, and the Japanese yen. See "Managing Exchange Risks in a Floating World," *Financial Management* (Summer 1976), 55.

domestic currency. In this case, the SDR will have more volatility than the domestic currency-domestic currency rate, the magnitude of the latter being zero.

GENERALIZATION OF THE RESULTS OF SDR DENOMINATED IN ANY OF ITS COMPONENT-CURRENCIES

The results of analyses of variation between the exchange rates and the SDR denominated in a non-dollar currency indicate that the latter does not have the least variation. Only the exchange rate between the SDR and the dollar shows variation. The reason for greater variation in the SDR/non-dollar rate (e.g., SDR/X) is the greater variation in the dollar/X exchange rate. Since the IMF derives the exchange rate between the SDR and another currency (e.g., SDR/X) by multiplying the rate dollar/X with SDR/dollar, it is obvious that the variation in SDR/X rate is dependent on the variation in SDR/dollar rate and on variation in dollar/X rate (refer to Appendix). To prove that SDR/X has the least variation among other exchange rates, the variation in dollar/X rate should be the minimum (the variation in the SDR/dollar rate has empirically been proved to be the minimum). The results can mean only that the volatility in the dollar/X rate (and not any factor intrinsic to the SDR) is causing the volatility in the SDR/X rate. This situation has arisen because of the IMF's method to derive an SDR rate for a non-dollar currency. It considers the dollar equivalents of the currency-components, and this could probably be the reason for the low variation in the SDR/dollar exchange rate. If the IMF were to change its method of valuation of an SDR by considering the pound-sterling equivalents of its component currencies, variation in the SDR/pound sterling exchange rate would probably be the lowest.

The variation in an exchange rate (e.g., X/Y) is the same as variation in the exchange rate (Y/X). This result arises because of the definition of the criterion variable (i.e., the standard deviation of the absolute logarithmic change in the exchange rate). Since the absolute logarithmic change of (X/Y) is the same as the absolute logarithmic change of (Y/X), the standard deviation is also the same. This result may hold true in the existing rate system wherein a currency arbitrageur will eliminate all sources of profit between the exchange rates (X/Y) and (Y/X), thereby equating the risk between the two, that is, its standard deviation (a proxy for volatility/risk) will be the same for both (X/Y) and (Y/X). This result depends on the absence of transaction costs and other factors.

IMPLICATIONS OF USING THE SDR AS A UNIT OF MEASUREMENT

The SDR has still not achieved the status of a world currency. It can achieve that status only when it performs the three functions of money: as a unit of account (or as a "numeraire"), as a store of value, and as a medium of exchange. Given the existing stage of economic development, the world money's main function will be that of a numeraire or a unit of account. There is nothing inherent in the concept of the SDR to limit its role to that of a numeraire only. It can become money if it performs as a medium of exchange and as a store of value.¹⁵

The SDR is used as a unit of measurement by international financial institutions, such as the IMF and the International Bank for Reconstruction and Development (IBRD). In fact, the IMF and the World Bank present their financial statements in terms of SDRs¹⁶ and in terms of dollars. If these stateless organizations use SDRs as their measuring unit, there is no reason why multinational corporations (which may be regarded as stateless to the extent they deal in more than one currency) cannot make use of SDRs in external reporting. The IMF, the monitoring authority of the SDR, permits additional uses of SDRs among participant countries and prescribed holders.¹⁷ To the extent the SDR can be used to settle financial obligations between participant countries and prescribed holders, it serves as a medium of exchange.¹⁸

One can be easily misguided by carrying the concept of the SDR as a unit of measurement to the extreme. Using SDRs as a numeraire in case of corporations having no operations in foreign currencies or in foreign currencies which do not comprise the SDR will be meaningless. The domestic currency is the most appropriate unit of measurement in case of companies having no dealings in foreign currencies. It must be remembered that the SDR is not a true representation of a world currency unit. If all the currencies which are used in settlement of financial obligations are included in the basket and a weighted average is taken on a

¹⁵ Aschhiem and Park, *Artificial Currency*, 7.

¹⁶ IMF, Annual Report (1984), and The World Bank Annual Report (1984).

¹⁷ The additional uses are as follows: to use SDRs in the settlement of financial obligations; to buy and sell SDRs forward; to borrow, lend, or pledge SDRs; to use SDRs in trades; to make donations (grants) of SDRs; and to use SDRs as security for performance of financial obligations. See IMF, *Selected Decisions* (Tenth Issue), 278-88.

¹⁸ SDRs were used in the settlement of fourteen financial obligations (other than in repayment of loans for quota payments) for a total of SDR 25 million. These transfers represented primarily debt service on loans. (IMF, Annual Report, 1984, 87).

basis similar to that of the SDR, a proxy for the world currency can be derived. The domestic currency will still be the best unit of measurement for operations involving the domestic currency only, and the global currency unit will be the best unit of measurement for reporting operations involving foreign currencies. The financial statements will be more meaningful if they are reported in terms of a single currency unit, in addition to being stable over a period of time. Such a composite currency unit can give true meaning to the word "multi" in "multinational corporation."

There are some inherent limitations in the analysis presented. It is assumed that there is no interaction between variables (i.e., cross-currency influences are absent). This can be true only if currency arbitrageurs remove all sources of profits in intracurrency trading and make such interaction minimum. The exchange rates were collected at the end of the month; this may cause them to be unrepresentative for the whole month.

The problems with the use of the SDR as a numeraire are many, but they are not unsurmountable. The SDR is used as a numeraire by a number of international and regional organizations and in capital markets. In addition to the World Bank, the International Development Agency, and the IMF, the following also make use of the SDR as a unit of account: African Development Bank, African Development Fund, Arab Monetary Fund, Asian Clearing Union, Asian Development Bank, Great Lakes States Development Bank, East African Development Bank, Economic Community of West African States, European Conference of Postal and Telecommunications Administration, International Centre for Settlement of Investment Disputes, International Fund for Agricultural Development, International Telecommunications Union, Islamic Development Bank, Nordic Investment Bank, and the Universal Postal Union. In recent years, the SDR has played an increasing role both as a denominator and as a unit of contract and, in some cases, as the basis for a privately issued currency composite.¹⁹

The accounts of the IMF are expressed in terms of the SDR, the currency value of which is determined daily by the Fund. It is derived by summing the values in U.S. dollars, based on market exchange rates, of a basket of five specified currencies, as follows:

¹⁹ IMF, Annual Report (1984), 88.

| <u>Currencies</u> | <u>Amount</u> |
|-------------------|---------------|
| U.S. dollar | 0.54 |
| German mark | 0.46 |
| French franc | 0.74 |
| Japanese yen | 34.0 |
| Pound sterling | 0.071 |

Members' currencies are valued in terms of the SDR on the basis of a representative rate of exchange determined in accordance with the rules of the Fund.²⁰ The exchange rate between a nation's currency and the SDR is published daily by the IMF. By consolidating accounts in SDR/unit of domestic currency, one is indirectly pegging that currency to the SDR. The movement of currencies pegged to the SDR has been much smoother than that of a currency pegged to any other currency or composite currency unit. This is illustrated in Exhibit 2.

In recent times, currencies pegged to the dollar have appreciated substantially while those pegged to the French franc depreciated significantly. Any change in the exchange rate, whether it is an appreciation/depreciation relative to the domestic currency, is unwelcome, and the lower the magnitude of the change, the better it is for reporting earnings. The use of the SDR minimizes the yo-yo effect of exchange rate variations, without being dependent on any translation method or on management's actions and manipulations. Earnings tend to smooth out over a period of time without any interference from management.

Reporting earnings in a uniform measuring unit facilitates comparison of performance between all operations, domestic and overseas. "The standards of measurement for overall management of all operations, domestic and foreign, must be the same and must be the standard of measurement in the reports to the outsiders of the company as a whole."²¹ According to the World Bank Annual Report, expressing the value of assets and liabilities in terms of SDRs rather than in terms of U.S. dollars does not have a material effect on the financial position or results of the operations of IBRD.²² For translating currencies in terms of SDRs, the average market rate of exchange in effect during each month was considered.²³

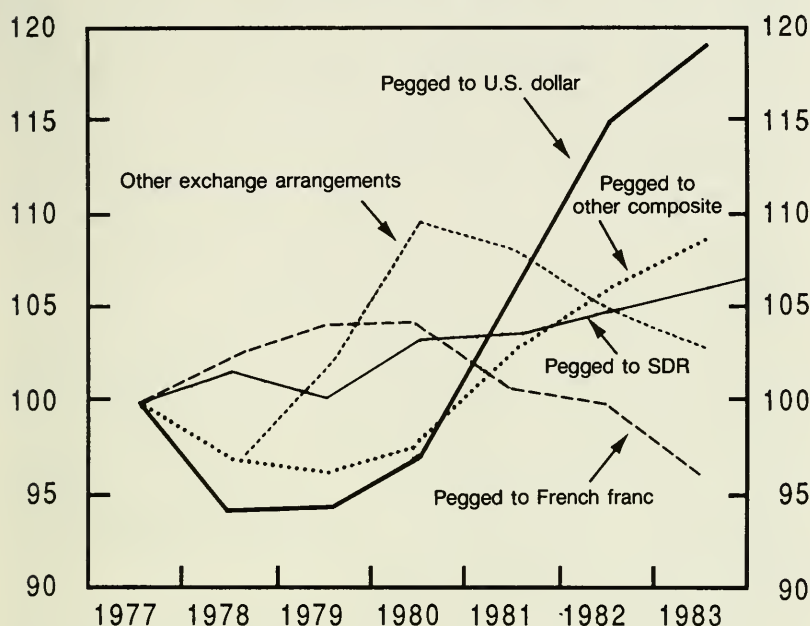
²⁰ Ibid., 167.

²¹ Leonard Lorenson and Paul Rosenfield, "Management Information and Foreign Inflation," *Journal of Accountancy* (December 1974), 98-102.

²² The World Bank Annual Report (1984), 179.

²³ "Income is generally translated at an average of the market rates of exchange

Exhibit 2. Real Effective Exchange Rates of Developing Countries for the Period 1977-83
(Indices, 1977 = 100)



Source: IMF, Annual Report (1984), 49.

SDR AND THE CURRENT FINANCIAL ACCOUNTING STANDARDS

The SDR overcomes some of the criticisms levied against the introduction of SFAS No. 52. The dissenters of SFAS No. 52 criticized the statement for adopting objectives that were at variance with the single entity and the "single unit of measure" concepts which underlie consolidated financial statements. The standard-setting board responded to this criticism by arguing that a true "single unit of measure" did not exist.²⁴ The SDR, however, comes very close to meeting the criterion of a "single unit of measure" and would indirectly help to achieve the objectives of SFAS No. 52.

in effect during each month. . . . Translation adjustments relating to the revaluation of development credits denominated in SDRs are charged to Cumulative Translation Adjustment account" (The World Bank Annual Report, 1984, Appendix G).

²⁴ Financial Accounting Standards Board, *Statement of SFAS No. 52* (Stamford, Conn.: FASB, 1981), par. 85.

As far as reporting currency cash flows is concerned, it does not matter whether translation adjustments are made using the exchange rates or using the SDR rate. "Translation adjustments are solely a result of the translation process and have no direct effect on reporting currency cash flows."²⁵ Failure to enable investors to predict future cash flows is not a serious limitation of the SDR. The current practice of translating foreign-currency denominated historical cost items at current exchange rates may yield a figure which is neither a meaningful description of past cash flows nor a description of future flows.²⁶ The SDR suffers from the same weakness as the dollar under the current translation methods insofar as prediction of cash flows is concerned.

One of the potential weaknesses of SFAS No. 52 is that it may cause numerous year-to-year changes in a functional currency because of its requirement that the U.S. dollar be used as the functional currency in highly inflationary economies. The SDR will not only stabilize reported earnings over a period of time but will also eliminate the requirement to substitute the "hyperinflationary currency" with the domestic currency. Distortions created by hyperinflationary economies on their respective exchange rates will be eliminated if SDRs are used.

The introduction of SFAS No. 52 in 1981 was the result of a need to reduce unnecessary volatility in reported earnings caused by SFAS No. 8. A questionnaire survey of multinationals which adopted SFAS No. 52 prior to its effective date found that 82.8 percent of respondents favored early adoption because of anticipated reduction in volatility of future earnings.²⁷ The findings of this study strengthens the case for SDR as a unit of account.

SDR AND SOME INTERNATIONAL ACCOUNTING ISSUES

The use of the SDR as a unit of measurement creates unique problems and situations not found in usual accounting practices. Would it be correct to adjust the SDR by a worldwide purchasing power index to arrive at a constant SDR? Is it more logical first to adjust the SDR for worldwide inflation than to adjust the currencies for inflation in their respective countries and then to translate the adjusted rates in terms of SDRs? There are obvious

²⁵ Ibid., par. 111.

²⁶ T. I. Selling and George H. Sorter, "FASB Statement No. 52 and Its Implications for Financial Statement Analysis," *Financial Analysts Journal* (May-June 1983), 64.

²⁷ Thomas G. Evans and William R. Folks, Jr., "Analysis of the Impact of Statement 52 on Disclosures of the Effects of Changing Prices" (College of Business Administration, University of South Carolina, Columbia, 1983).

limitations in the measurement of any purchasing power index, but the question is whether the accounts are rendered less inaccurate if SDRs are used. The author feels that the measurement error inherent in the worldwide purchasing power index is reduced if SDRs are used compared to the measurement error in all the respective countries' inflation indices. The underlying assumption is that the error in the measurement of global purchasing power index is less than the sum of the errors in the measurement in each country's inflation index.²⁸

Management using the SDR-based system need not worry if the IMF changes the weights assigned to the currencies in the basket.²⁹ The financial statements need not be recomputed to reflect the position on a "base SDR" basis. Since factors causing variations in exchange rates are not accounted for in the books, there is no reason why financial statements denominated in SDRs need to be recomputed when the underlying weight structure is changed. This can be a debatable issue, and critics may point to it as an inherent weakness of this unit of measurement.

Management techniques such as capital budgeting, transfer pricing, and other financial control systems may have to be modified in light of the new unit of measurement. If management was previously building the exchange rate risk into the discount rate while evaluating international capital projects, a lower amount of exchange rate risk may have to be built into the discount rate since the SDR rate is inherently more stable. Any other management control technique based on SDRs will have an advantage of relatively more stability of input data than any other exchange rate. The internal forward rate approach suggested by Lessard and Lorange for decision making and performance evaluation can be equally applicable in case of "projected SDRs."³⁰

Normally, management does not consider currency fluctuations

²⁸ This approach is consistent with the translate-restate approach recommended by Lorenson and Rosenfield, "Management Information and Foreign Inflation," 98-102.

²⁹ The currencies that determine the value of the SDR and the amount of each of these currencies will be revised every five years, beginning January 1, 1986, unless the Fund's Executive Board decides otherwise. The currencies under consideration will be those of member countries of the Fund with the largest exports of goods and services during the latest five-year period for which full data are available (for example, 1980-84 for the revision effective January 1, 1986). See "The International Monetary Fund: Its Evolution, Organization and Activities," Pamphlet Series #37 (1984).

³⁰ Donald Lessard and Peter Lorange, "Currency Changes and Management Control: Resolving the Centralization/Decentralization Issue," *Accounting Review* (July 1977), 634-36.

while setting transfer prices. Devaluation and revaluation of currencies are usually pre-investment considerations, but they enter into transfer-price determination as a means of protection. Companies whose home currency is in danger of devaluation often accumulate hard currency reserves by shipping goods to (or buying goods from) hard currency subsidiaries at high hard currency prices.³¹ It will make little difference whether transfer prices are set in terms of SDRs or in terms of domestic currency since exchange rates are beyond the control of the management.

The SDRs can, however, help to keep the transfer prices stable. Normally, transfer prices would be raised when exchange rates are weakening so that more dollars are realized at the current rate rather than obtaining fewer dollars at depressed rates. This hike in transfer prices need not be done if they are denominated in SDRs. Budgets can be set for the parent and subsidiaries in terms of SDRs. The problems of performance evaluation of subsidiaries are reduced when all units are evaluated in a common denominator which is not a currency specific to a subsidiary/parent company. No unit will be unfairly treated as far as the impact of exchange fluctuations on earnings is concerned. Communication between operating units is also rendered easy if every unit speaks in terms of SDRs.

It will be surprising if the introduction of the SDR as a unit of measurement is not met with resistance by the investment community, the tax authorities, and even by the management of subsidiaries. Management will find it difficult to supply dual statements. The "primary" financial statements would have to be prepared in accordance with the generally accepted accounting principles of the company's country of domicile and in that country's currency. The secondary statement would be prepared on a global basis, but in terms of SDRs.³² The introduction of the SDR as a unit of account can be done gradually. Initially, the multinationals can provide, by way of supplemental information, the results of their operations on a consolidated basis in terms of SDRs. The provision of additional information will definitely involve more costs, but these costs will be offset by the benefits such information will provide to the users. Management will avoid indulging in suboptimal actions such as hedging and other oper-

³¹ Jeffrey S. Arpan, "International Intracorporate Pricing: Non-American Systems and Views," *Journal of International Business Studies* (Spring 1972), 11.

³² The classification of the dual statements was suggested by the Accountants International Study Group in "International Financial Reporting" (London, 1975), par. 39.

ations which were hitherto undertaken to reduce accounting exposure.

The SDRs do not meet the three bases of currency selection as suggested by Mueller: the legal basis, the transaction basis, and the ownership basis.³³ The SDR does meet the requirement of a global currency of a group where a "group" is "a whole whose focus is on world-wide objectives as well as local objectives, each part making its unique contribution with its unique competence."³⁴ Currency translation into SDRs will involve the same procedure as currency translation into dollars or any other functional currency. The foreign income statements could be translated using average monthly rates³⁵ or weighted averages of current rates.³⁶ The SDR as a unit of measurement may be criticized on the grounds that the translation process will involve two steps instead of the usual one: translation of foreign currency into the SDR equivalent and translation of the domestic operations into the SDR equivalent. With the advent of high-speed computers, this argument will not be valid.

The maximum resistance to the introduction of SDR will come from the readers of financial statements. Their level of understanding of this concept may not be high. They will probably have difficulty in conceptualizing the SDR. They may be able only to conceptualize the purchasing power of a foreign currency, and understanding the SDR may be too difficult for them. Can one say how many SDRs are needed to buy a can of beer or what the price of a car is in terms of SDRs? The transformation from a dollar-based system to an SDR-based system will be a difficult process, although the readers of financial statements which have been denominated in SDRs will get used to them in time.

CONCLUSIONS

The restrictive applicability of the SDR makes its use in international accounting very doubtful. Unless the IMF makes its use unrestrictive by extending the scope of "prescribed holders" to multinational corporations and individuals, it will continue to be

³³ Gerhard G. Mueller, *International Accounting* (New York: Macmillan, 1967), 208-13.

³⁴ Howard V. Perlmutter, "The Tortuous Evolution of the Multinational Corporation," *Columbia Journal of World Business* (January-February 1969), 9-18.

³⁵ Arthur Andersen & Co., *Accounting Standards for Business Enterprises Throughout the World* (1974).

³⁶ American Accounting Association, "Report of the Committee on International Accounting," *Accounting Review* (Supplement to Volume 50, 1975), 90-95.

ignored by the business community. Even if it gains popularity, its effectiveness will depend on whether it is used in place of its currency components. It does serve the purpose of a world currency unit as it consists of five of the largest trading countries of the world. If a company has operations in developing countries with weak currencies, the SDR may be inappropriate as a unit of measurement. In such cases, the exchange rates themselves or a composite currency unit based on the basket of currencies involved may be used as a unit of measurement.

Even a strong currency, such as the dollar, can create problems. For example, international banks whose Latin American debts were denominated in dollars had to incorporate a clause at the time of restructuring of debt that enabled them to translate the dollar-denominated debt in a different currency unit. The strong dollar was causing a lopsided effect on their balance sheet figures. In today's international monetary system, at any point of time there will be at least one strong currency vis-à-vis the others, and this will create translation losses/gains for a company dealing in two or more currencies. The SDR, on the other hand, will remain more stable relative to its currency-components at any point in time.

The SDR has lost the glamour it had in 1981, when the number of currencies in its basket was reduced from sixteen to five. The probable reasons for its downfall could be the rising dollar and its esoteric applicabilities. The author strongly feels that, in the event of the crashing of "superdollar," or a major breakdown in the international monetary system, a search will be made for a standard which is inherently stable, and the SDR can easily take that place. Burns has suggested that a return to "the rule of law in international monetary affairs" can be realized, inter alia, by devising a new denominator, such as the SDR.³⁷

It appears to be only a matter of time until the commercial world realizes the inherent frailty of a single currency and the strength of a group of currencies. Accounting for overseas operations will become much easier and simpler to understand if a single currency unit is used. Until that time, one can only conceptualize, not realize.

APPENDIX. VALUATION OF CURRENCIES IN TERMS OF SDRs

The rule 0-2 (a), (b), and (c) of the International Monetary Fund as amended to date states the mode of valuation of currencies in terms of SDRs. It reads as follows:

³⁷ Arthur F. Burns, "The Need for Order in International Finance," *Columbia Journal of World Business* (Spring 1977), 5-12.

- “0-2(a) The value of the United States dollar in terms of the SDR shall be equal to the reciprocal of the sum of the equivalents in United States dollars of the amounts of the currencies specified in Rule 0-1 calculated on the basis of exchange rates established in accordance with procedures decided from time to time by the Fund.
- (b) The value of the currency other than the United States dollar in terms of the SDR shall be determined on the basis of the value of the United States dollar in terms of the SDR in accordance with (a) above and an exchange rate for that currency determined as follows:
- (i) for the currency of a member having an exchange market in which the Fund finds that a representative spot rate for the United States dollar can be readily ascertained, that representative rate;
 - (ii) for the currency of a member having an exchange market in which the Fund finds that a representative spot rate for the United States dollar cannot be readily ascertained but in which a representative spot rate can be readily ascertained for a currency as described in (i), the rate calculated by reference to the representative spot rate for that currency and the rate pursuant to (i) above for the United States dollar in terms of that currency;
 - (iii) for the currency of any other member, a rate determined by the Fund.
- (c) Procedures to establish exchange rates under (b) above shall be determined by the Fund in consultation with members.”*

* International Monetary Fund, *By-Laws, Rules and Regulations: International Monetary Fund* (August 1, 1984), 56–57.

Contingency Theory as a Framework for Research in International Accounting

JAMES A. SCHWEIKART*

A review of international accounting literature reveals that harmonization of accounting principles, international differences in information content and style, and concern for the standardization of reporting systems for multinationals are among the pervasive themes. Due in part to the exploratory nature of this type of research, few attempts have been made to develop a theory of international accounting. Rather, many of the earlier writings in international accounting are documentations of comparative international accounting practices.¹ Others are descriptions of various individual country practices.²

Some works have attempted to cluster national practices with the goal of eventually explaining the reasons for national accounting differences. Often through conjecture or with limited evidence, these works offer some explanations.³ Other works have tried to determine if there are differences among countries in information needs for the same decisions but have made little or no attempt

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¹ Price Waterhouse, *International Survey of Accounting Principles and Reporting Practices* (London: Butterworth, 1980).

² Frederick D. S. Choi and Gerhard G. Mueller, *An Introduction to Multinational Accounting* (Englewood Cliffs, N.J.: Prentice-Hall, 1978), chapter 6.

³ R. C. DaCosta, J. C. Bourgeois, and W. M. Lawson, "A Classification of International Financial Accounting Practices," *International Journal of Accounting* (Spring 1978); and R. D. Nair and Werner G. Frank, "The Impact of Disclosure and Measurement Practices on International Accounting Classifications," *Accounting Review* (July 1980), 426-50.

to explain those differences.⁴ Finally, there has been suggestion of environmental influence on information needs in different countries but little empirical work to support this concept and no formal statement of theory on which to base empirical research.⁵

A theory is needed to provide (1) motivation for international accounting research, (2) guidelines for designing effective research, and (3) a method to interpret and summarize research results. The theory should be drawn from an existing theory from another discipline, such as social psychology, economics, or cross-cultural psychology, to augment its credibility. Preferably, the theory employed should have some prior use either in accounting or international business.

This paper proposes contingency theory as a vehicle to establish a theory of international accounting. Both financial and managerial accounting, as well as the implications for research on these two areas, are discussed within this framework.

COMMON ISSUES IN INTERNATIONAL ACCOUNTING

The Kraayenhof proposal for a harmonization of accounting principles generated the counter argument that achieving harmonization might be very difficult, due to national environmental differences.⁶ The environment has been suggested as the source of accounting practices and information. Since national environments are very diverse, the goal of harmonization may be unattainable.

Differences in the use of information have also been attributed to national environments. For example, evidence has been found that Europeans are balance sheet oriented in investment decisions, and North Americans are income statement oriented.⁷ This explanation of differences in information needs in different parts of the world was used to explain differences in internal information needs, as well.⁸ Indeed, some evidence suggests a relationship between the national environment for business and information

⁴ Ahmed Belkaoui, Alfred Kahl, and Josette Peyrard, "Information Needs of Financial Analysts: An International Comparison," *International Journal of Accounting* (Fall 1977), 19-27.

⁵ Choi and Mueller, *Multinational Accounting*, chapter 8.

⁶ Jacob Kraayenhof, "International Challenges for Accounting," *Journal of Accountancy* (January 1960), 34-38; and Irving L. Fantl, "Case Against International Uniformity," *Management Accounting* (May 1971), 13-16.

⁷ Belkaoui, Kahl, and Peyrard, "Information Needs," 19-27.

⁸ Helen G. Morsicato and Lee H. Radebaugh, "Internal Performance Evaluation of Multinational Enterprise Operations," *International Journal of Accounting* (Fall 1979), 77-94.

needs of local managers for internal decisions.⁹ Both financial accounting and managerial accounting, therefore, are said to be influenced by national environments, resulting in global differences in information needs, information use, and consequently types of information.

This contention is a form of contingency theory. Contingency theorists in management maintain that management practices are not universal to achieve effective operations for an organization. Rather, in an uncertain environment, management practices must differ from those in a certain environment. The environment usually consists of an internal (organization) and external (outside the organization) component.

Management accounting has employed contingency theory to explain the information needs of managers. For uncertain task environments, large amounts of information, including information outside the accounting system, such as informal discussions, are necessary for managers to make effective decisions. In stable or certain task environments, low amounts of information are necessary for effective decisions. The information from the accounting system is generally adequate for these decisions.¹⁰ Exhibit 1 illustrates contingency theory for managerial accounting.

Exhibit 1. Contingency Theory in Managerial Accounting

| | | Type of decision | |
|-------------|--------------------------------------|---------------------|-------------------------|
| | | Ineffective | Effective |
| Environment | Unfavorable Unstable Uncertain | | |
| | Favorable Stable Certain | | |
| | | Basic and formal | Complex and informal |
| | | Information | |

⁹ James A. Schweikart, *The Value of Managerial Accounting Information to U.S. Manufacturing Firms Abroad* (Ann Arbor, Mich.: University Microfilms, 1984), chapter 5.

¹⁰ Vijay Sathe, "Contingency Theories of Organizational Structure," in *Managerial Accounting: The Behavioral Foundations*, ed. J. L. Livingstone (Columbus, Ohio: Grid, 1975), 51-63.

CONTINGENCY THEORY FOR INTERNATIONAL ACCOUNTING

National environmental differences represent both external and internal contingencies on accounting information needs. Some decision-making environments are stable, certain, or favorable. Other environments are unstable, uncertain, or unfavorable. The difficult task is to identify those salient environmental variables which can be expected to affect the decision situation and, accordingly, the information needs of the decision maker.

The field of comparative management has augmented this process by identifying likely variables for a contingency model. Educational, economic, political-legal, and social environments have been identified as potential factors affecting several management functions, including accounting control.¹¹ There has been some success using these variables to explain performance within multinational corporate operations.¹² Similar cultural variables have also been used to document an association of European styles of management with national attributes.¹³

MANAGERIAL ACCOUNTING: ENVIRONMENTAL CONTINGENCY MODEL

Exhibit 2 illustrates the contingency model for managerial accounting. The environment (education, economics, political-legal, socio-cultural) has two external effects. The A_1 effect on the structure and type of organization results directly from the environment. For example, the political-legal and economic environments of the People's Republic of China dictate the need for organizations concerned with cost control rather than profit making and the need for organizations with government ownership or control. In a country with private ownership and limited government interference, the corporate form of organization and accountability will be generated. Of course, most national environments are between these extremes and, accordingly, there is a variety of types and structures of organizations.

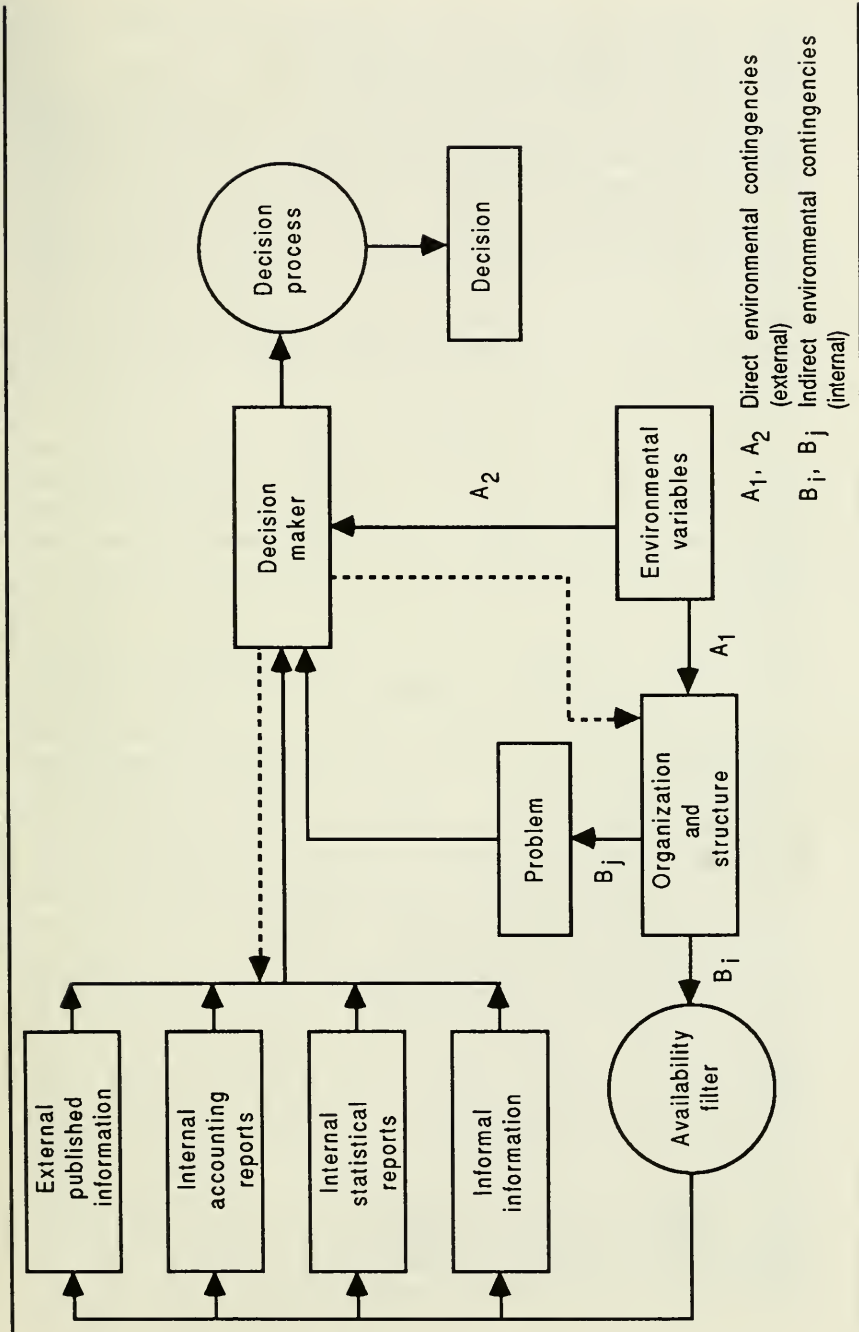
The A_2 external effect is the more obvious contingency, since the environment affects the decision process (task situation) directly. In an economic environment with a high rate of inflation (unfavorable), such as Brazil, cost control becomes a nearly impossible

¹¹ Richard N. Farmer and Barry M. Richman, "A Model for Research in Comparative Management," *California Management Review* (Winter 1964), 55-68.

¹² Wagdy M. Abdallah, *An Investigation of the Management Accounting Framework for Performance Evaluation in American Multinational Enterprises* (Ann Arbor, Mich.: University Microfilms, 1982).

¹³ Jacques Henri Horowitz, *Top Management Control in Europe* (New York: St. Martin's Press, 1980), 147-60.

Exhibit 2. Contingency Theory — Managerial Accounting Model



task as compared to that in the United States, where the current economic environment is more favorable.

The internal effects are from the internal organizational environments but are clearly related to the external environment. The organization makes available information to managers, B_i , for problems indigenous to its operations, B_j . This information is made available to managers through its availability filter, largely a cultural (both national and corporate) factor. The decision maker, then, selects and uses information to solve the problem at hand. The broken lines represent reselection if a changing environment alters the task situation, necessitating additional information, and influence on the organization when the existing information requires revision or is otherwise inappropriate.

Given this framework, multinational corporations face two potential difficulties. First, if they organize the structure of their foreign affiliates to be consistent with the structure of the domestic parent, there may be conflict with the local managers due to the expected type of organization, even though the organization is within the foreign political-legal framework. Foreign managers would have to adjust to an unfamiliar form of management. Second, assuming the first conflict is resolved, if the resulting information is standardized within the multinational firm, a common situation, inappropriate information may be available to decision makers for their problems, due to the A_2 effect.¹⁴ That is, different information would be expected under contingency theory for cost control problems in Brazil as compared to cost control problems in the United States in order for decisions to be effective in both countries.

The A_2 effect has caused some researchers to claim that standardized systems are inappropriate for multinationals.¹⁵ Some researchers maintain that standardized reporting may cause foreign managers to perform for the accounting system rather than solve the unique problems at hand. This could cause a misallocation of resources.¹⁶ Some evidence has been found that indicates that different information is used for the same decision within a multinational having a standardized system when the economic and education environments differ.¹⁷

¹⁴ Sidney M. Robbins and Robert B. Stobaugh, "The Bent Measuring Stick for Foreign Subsidiaries," *Harvard Business Review* (September-October 1973), 80-88.

¹⁵ Choi and Mueller, *Multinational Accounting*, 260.

¹⁶ Morsicato and Radebaugh, "Internal Performance Evaluation," 77-94.

¹⁷ Schweikart, *Managerial Accounting Information*, chapter 5.

IMPLICATIONS FOR RESEARCH

The major goal of international managerial accounting research should be to ascertain the specific environmental variables in the contingency model, the A_1 and A_2 effects. To isolate these variables, research should be conducted on a worldwide basis where similarities in organizational structure, available information, and decision problems are controlled. Hence, the A_2 effect on information needs provides the independent variables in a cross-national study. The most effective method of achieving this control is by conducting several experiments throughout individual multinational corporations. In effect, the case method is necessary to arrive inductively at a contingency theory. The Farmer-Richman variables might be used as a point of departure. If some of these variables drop out as insignificant, others can be introduced.

It is important to note that no multinational corporation has a purely standardized system nor is organized exactly the same worldwide. When results are interpreted, these factors must be reintroduced to understand appropriately the differences in information needs. However, this procedure should still highlight the salient environmental variables.

FINANCIAL ACCOUNTING: ENVIRONMENTAL CONTINGENCY MODEL

The financial accounting model, Exhibit 3, is similar to the managerial model. The environment is again an external contingency on organizational structure, as well as types of financial institutions, A_1 , and the decision environment, A_2 . The types of institutions and organizations cause the types of external information available, B_i , and the kinds of decisions for outsiders such as investors and lenders, B_j . Decision makers will select information for effective decisions, and the external environment may affect that selection. As in the managerial model, the broken lines represent the demands by the decision maker on the institutions for information.

As an example, the environment (education, economic, political, social, etc.) provides the types of organizations, such as corporations, stock exchanges, and controlling agencies (e.g., Securities and Exchange Commission — SEC). These institutions within a cultural framework (filter) provide information to the public for equity and lending decisions by outsiders to the firm. From the available information, investors et al. choose information to make decisions. Should the information not be relevant, decision makers, often through institutions, seek changes in the information available to them from the organizations.

The change in the U.S. economic environment, for example, caused a change in the decision environment. Traditional historical cost information no longer had the same application. Thus, change through the SEC and the accounting profession generated Financial Accounting Standard No. 33 requirements upon corporations. New information became available to the decision maker. This same model can be used to explain differences in accounting policies among nations with different national business environments.

IMPLICATIONS FOR RESEARCH

The problem, again, is one of isolating the environmental variables affecting information needs (A_2), since contingency theory implies that information needs should vary with variations in the favorability or certainty of the decision environment. This is much more difficult in the financial model, since differences in institutions and information cannot be held constant in a cross-national comparison. Further, there is no real assurance across nations of decision problem uniformity. Accordingly, identifications of environmental variables through the financial model should be viewed with caution.

This does not suggest, however, that for now researchers should concentrate on only the managerial model, since that model may be more conducive to sounder findings. While the managerial environment and financial environment contain many of the same significant variables, it is doubtful that the environments are exactly the same. Thus, comparative research using nations with very similar accounting methods, institutions, and decision problems may be the only vehicle available to extract many significant environmental variables. This research design implies that the environments in such countries will have a high degree of similarity, but that subtle differences may be more reliable predictors of information-relevance differences.

CONCLUSIONS

Problems of the harmonization of accounting principles and the standardization of internal reporting systems for multinationals are within the same general theoretical model. The financial and managerial models, however, likely do not contain entirely the same set of variables. For research purposes in both areas, the managerial model appears to be the means in which to start, merely because of the ability of the researcher to control the study. Even

so, more risky research using the financial model is necessary in the end, to gain a complete understanding of contingency theory in international accounting.

A proper understanding of the contingency model in international accounting is imperative to the development of effective internal reporting systems for day-to-day operations, as well as for proper performance evaluation. This understanding is also vital to the success of harmonization efforts. Once the environmental variables are known, realistic harmonization goals and efforts can occur.

Development of Accounting Education and the Accounting Profession in Third World Countries: Botswana

WILLIAM MARKELL*

In any organization, whether it be a corner grocery, a not-for-profit enterprise, a commercial or industrial enterprise, or a developing nation, the adoption of an accounting system is important. In the case of nations, a well-designed and implemented accounting system is essential to enable the managers of the economy to determine from a financial viewpoint what has occurred in the past and to measure these results against the objectives. This information would also enable the national economic planners to allocate resources in the future. For a country to exercise control over the management of its own economy, an indigenous accounting profession must be developed as the means to train and educate accounting practitioners at all levels. This paper discusses the development of the accounting profession and accounting education at the university level in a relatively new nation, Botswana.

THE ACCOUNTING PROFESSION

For an accounting system to be implemented on a continuing basis, an accounting profession must exist. In a new or developing country, the accounting profession can be developed or created in one of two ways. It can develop appropriate educational institutions to prepare individuals to enter the accounting profession. Obviously, this approach would require much time to prepare individuals to the desired level of competence. The second and simpler

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alternative, especially in the early stages of a nation's development, is to create an "instant" profession.

Assuming that an economic system is evolving and that cultural, commercial, financial, governmental, and industrial enterprises develop, a need for the presence of an accounting profession will become apparent. Such organizations would require funding at the beginning, as well as for expansion purposes. Typically, before funds become available, the financial statements and projections of an entity need to be reviewed by independent professional accountants or other experts from potential funding agencies. In a newly developing country, these experts will necessarily be available only outside the country. Typically, accounting firms establish new practice offices in a developing country by importing qualified expatriates as experts. Thus, a new national accounting profession is born.

NEED FOR INDIGENOUS ACCOUNTANTS

The natural desire to have "locals" or citizens of the country occupy these prestigious professional positions is soon evident. The professional accounting firms are also interested in developing a local staff because subsidies, as well as relocation costs, are incurred when outsiders are successfully recruited. The firms also have a humanitarian interest due to their sense of obligation to assist the local citizens develop to their fullest potential. Political pressure to "localize" as quickly as possible undoubtedly exists. A variety of ways are typically used to accomplish the localization goal. On the assumption that educational planning has kept pace with the nation's development, the certificate, diploma, and bachelor's degree programs will be in place producing clerks, bookkeepers, and accountants for the nation.

Botswana and other developing countries in Southern Africa provide examples of the application of the second alternative where a profession of experienced professionals consisting largely of expatriates, both white and non-white, was created very quickly. In the approximately twenty years since independence, several developments have occurred simultaneously. Some of the regional and international firms of independent accountants (chartered or certified public) established offices in the various countries to serve existing and potential new clients. Initially, experienced personnel from neighboring countries (Zimbabwe, South Africa) and from the United Kingdom were solicited. Since formal education for the accounting profession has understandably been slow developing

in many of the newer countries, the accounting firms tried different approaches to prepare the local citizens to assume an important place in the profession.

One method has been to recruit good secondary school graduates and train them through an "articled clerkship" for a period of approximately five years. An alternative has been to select university graduates, preferably with a bachelor's degree in commerce, and to train them through the clerkship level in a shorter period of time. Then a variety of stratagems was used to train local employees. A common strategy was for them to study for the various professional examinations by correspondence. Some students would then be sent to universities in South Africa, the United Kingdom, or the United States to seek a bachelor of commerce or equivalent degree. Some individuals would be sent to offices of the particular firm (in the United Kingdom, for example) to provide them a broader experience than is possible in the national environment, as well as to prepare them to take the various examinations required to become members of the various accounting institutes. The various plans to prepare individuals for the accounting profession did not successfully result in the numbers of capable accountants necessary given the costs involved, and these methods became less popular.

Concurrent with the attempts to prepare accounting professionals as summarized, the universities in the various countries gradually developed curricula they considered important for the continued economic development of the nation. Among the wide variety of options was one that emphasized the study of accounting and management. Such study recognized very early the importance of the preparation of citizens to be accountants and managers of the nation's commercial and economic life. Since most of the developing countries had no existing universities, many expatriates were recruited for the faculty and were gradually replaced with citizens as they acquired the appropriate credentials and experience.

The fact that programs in accounting were established at the university level did not mean that the demands for educated accounting professionals would be met. In general, the early graduates were not considered very capable. This was due to the combination of a new curriculum, new faculty, poor educational preparation of students prior to coming to the university, and low expectations. In time, the quality of the graduates improved and increasing numbers of graduates appear to meet the professional standards of the accounting firms. Even if an individual qualifies

with a bachelor's degree in commerce with a major in accounting and does well on the job, additional problems remain before the individual can become fully qualified — that is, receive the professional certification of CA (chartered accountant) or CPA (certified public accountant). Some of the newer countries are not yet organized administratively to confer the appropriate designation. There remain instances where the parliament has not passed an accountancy act so that no rules or guidelines presently exist for the profession. Other nations have laws but do not have organized professional accounting institutes to conduct training for the qualifying examinations or to give the examinations themselves. Again, the firms face the very real problem of the cost of sending their staff outside the country for the necessary preparation for and taking of the examinations. Is there a solution?

A reasonable solution is to establish a regional organization that could administer all the details of examinations and certification. A step in this direction appears to have taken place recently in Southern Africa. The English-speaking Southern Africa Development Coordinating Council countries met in Lesotho in June 1985 to discuss the creation of a regional accounting organization. Many are very skeptical of the ability of the several countries involved to cooperate in such a joint venture due to past failures in other areas. However, it is the only realistic hope for the establishment of a viable accounting profession in Southern Africa. Such tasks as training individuals and preparing and grading examinations appear to be beyond the current capabilities of the individual countries.

A CASE STUDY: BOTSWANA

Some historical background can explain the dearth of local professionally qualified accountants in Botswana. The country achieved its independence in October 1966. Reportedly, there were approximately only five miles of paved roads in the country at the time of independence. The remainder of the infrastructure also barely developed. Particularly relevant was the lack of a good educational system at both the primary and secondary levels. No university existed at the time. The combination of a lackluster educational system and the fact that the citizens were not urban dwellers but basically lived in villages throughout the country did not permit the exposure of the Matswana (the name applied to the people of Botswana) to think in business terms and certainly not of careers in business. The Matswana have been and to a large

extent still are a cattle-raising people. Only in recent years have some of the population begun the familiar migration to the urban areas.

Another factor related to the relative non-involvement of the Matswana in business and the business professions in the years since independence is that the vast majority of local business organizations were begun by expatriates from a variety of countries, mostly from South Africa. The same was true for the learned professions. As of 1985, only three "qualified" (professionally certified) accountants were natives: two were trained in the United Kingdom and one in the United States. As the educational system of the country continues to improve, and it has, the students of Botswana will be better prepared to deal with the mathematical and verbal concepts essential to the study of accounting. The maturing of the accounting program leading to the bachelor's degree in commerce (B.Com.) of the University of Botswana may offer the best long-term potential for preparing its citizens for the accounting profession.

University of Botswana

The University of Botswana has been completely independent only since July 1982. In 1974, the Universities of Botswana, Lesotho and Swaziland were created to serve the needs of these former British protectorates. In 1976, the University of Botswana and Swaziland (UBS) evolved with programs offered in both countries. In 1982 the universities were separated.

As the final separation approached, the Botswana Campus instituted a bachelor's degree in commerce for majors in accounting and management in the 1980-81 academic year. The first accounting majors graduated in June 1984. The accounting major for this degree is a four-year program and includes an examination of the required curriculum described here that is comparable to accounting programs in many parts of the world.

Year 1

| | |
|--------|--|
| E 101 | Communication Skills and Introduction to Literature ¹ |
| MS 101 | Mathematics for Social Sciences |
| ST 101 | Introduction to Statistics |
| EC 101 | Basic Economics |
| AM 100 | Introduction to Accounting |
| AM 101 | Introduction to Commerce |

¹ All courses but E101 meet for three hours a week for the academic year. E101 meets for six hours.

Year 2

- AM 200 Intermediate Accounting
- AM 201 Cost Accounting
- AM 202 Principles of Management
- AM 203 Quantitative Methods in Business Decisions
- AM 204 Mercantile Law
- AM 205 Company Law
- EC 202 Analysis of Market Economy

Year 3

- AM 300 Financial Accounting I
- AM 301 Management Accounting
- AM 302 Financial Management & Project Analysis I
- AM 303 Organization Theory
- AM 304 Marketing
- AM 305 Business Data Processing & System Analysis

Year 4

- AM 400 Financial Accounting II
- AM 401 Auditing
- AM 402 Financial Management & Project Analysis II
- AM 403 Taxation
- AM 404 Business Policy & Decision Making
- AM 405 Personnel Management

Designing a good curriculum is not difficult; one need only copy from the catalog of a university with a respected program. A review of the curriculum for the B. Com. major in accounting of the University of Botswana indicates that it is quite adequate. It is similar to accounting programs offered by accredited departments of accounting in the United States. With the possible exception of an excess emphasis on accounting courses, the curriculum appears well rounded. The curriculum is also consistent with other programs in the region.

The accomplishments of the University of Botswana in this perspective are impressive. Its campus was begun in late 1976, and the first accounting majors enrolled in 1980. This fast start was made possible by the ready availability of expatriate faculty, literally from around the world. The students (approximately 1,500 in the 1984-85 academic year) are principally citizens of Botswana. All levels of the national educational systems are still being actively developed with significant assistance from organizations such as the Peace Corps, which supplies teachers. Presumably the majority

of the best secondary school graduates attend the University, although some are given scholarships to universities in other countries. Botswana has made a fast start in accounting education, but the question remains whether the pace can be continued throughout the entire educational spectrum. Recruiting and retaining a good faculty require a substantial continuing effort which the University of Botswana has managed to this date to do. Each member of the Department of Accounting and Management Studies has a master's degree, and several have practical experience as well. As a group, the members of the department are concerned, conscientious teachers, knowledgeable in their specific areas, who also assist their students outside the classroom to ensure proper learning. The members of the department include natives of India, of other Asian countries, and of Botswana. The University is committed to "localize" the various positions and to this point is accomplishing this carefully. Its own citizens are being sent abroad for advanced education and then brought back to join the University. Two have received their master's degree in accounting at the University of Delaware. The faculty lack professional accounting qualification (CA, ACCA, CPA, etc.), but it appears that the local citizens will be sent outside the country to acquire the required training.

The outlook for the accounting program as a supplier of graduates for the accounting profession appears positive. There is great interest in majoring in accounting and business, not unlike that in the United States. The government has indicated these as priority areas for manpower training.

As with any professional educational program, the final decision on the quality of the accounting program at the University of Botswana will be determined in the marketplace. If the local accounting firms and industrial and commercial organizations are eager to recruit University of Botswana accounting graduates, the program will be successful. If they continue to prefer the expatriates because they are believed to be better prepared, changes will have to be made. The Department of Accounting and Management Studies of the University of Botswana is in a position to make a significant contribution to the accounting profession, as well as to the country. It must continue to attract good students and sufficient resources to achieve these important national goals.

An Appraisal of the Conceptual Issues on Backlog Depreciation and a Comparative Analysis of International Accounting Practices

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The challenge to devise a satisfactory accounting model to accommodate the financial reporting problems stemming from changing prices has compelled the accounting profession in various countries to propose alternative models. One of these is the current cost model. The primary advantage of this model is that it can generate a measure of income that a firm can sustain in the future or distribute in dividends while maintaining its existing operating capacity. This measure of income is compatible with the concept of physical capital maintenance. Revsine, among others, has argued that such an income measure, under certain restrictive conditions, is useful in assisting investors in predicting their cash flows and associated risk.¹

The income of a period under the physical capital maintenance approach is measured by matching the current cost of the assets sold or consumed with the realized revenue. There are, however, those who argue in favor of requiring backlog depreciation (i.e., catch-up depreciation if the current cost were increasing over several periods). If the current cost increases from period to period, the accumulated depreciation would not equal the replacement cost needed to maintain productive capacity, which might justify the need for backlog depreciation.

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¹ Lawrence Revsine, *Replacement Cost Accounting* (Englewood Cliffs, N.J.: Prentice-Hall, 1973), 86-138, in particular.

In view of the emphasis on current cost accounting in recent authoritative literature, the concept of "backlog" or "catch-up" depreciation has assumed greater prominence. Current cost accounting reflects the financial position and income in terms of the current entry prices of the items in question. This accounting model is intended to show the current purchasing or reproductive prices and to provide a more relevant balance sheet and income statement. "Backlog depreciation" is one aspect of current cost accounting constituting the difference between the total accumulated depreciation that would have been recorded based on the latest current cost or current replacement cost² and the total accumulated depreciation actually recorded in current cost accounting.³

There has been a debate as to the necessity for backlog or catch-up depreciation to equate the accumulated depreciation total to the amount needed to replace the asset. This paper discusses the importance of this issue and alternative views of the necessity for reflecting backlog depreciation, as well as proposed alternative methods of accounting for this concept. Additionally, a comparative analysis is provided on the treatment of backlog depreciation in selected international pronouncements on accounting for changing prices.

THE CASE FOR BACKLOG DEPRECIATION

Current (replacement) cost accounting is intended to preserve or maintain the operating capability of the firm; consistency would demand that a solution be found to the backlog issue, which occurs

² Current cost and current replacement cost are often used interchangeably, although there is a subtle but important distinction between them. Current cost is defined as the current purchase price of an asset owned, whereas replacement cost is the current purchase price of assets which will replace existing assets.

³ For example, assume there is an asset costing \$2,000 with an estimated useful life of two years. Assume also that the current cost of the asset increases by 10 percent each year. The depreciation expense based on the average current cost in each year would be \$1,100 in year 1 and \$1,155 in year 2, the total accumulated current cost depreciation being \$2,255. [The computations are as follows: with a 10 percent increase in the replacement cost of the asset, the cost of the asset will be \$2,200 ($\$2,000 \times 1.10$) at the end of the first year and \$2,420 ($\$2,200 \times 1.10$) at the end of the second year. Thus, the average replacement cost of the asset during the first year is \$2,100 $[(\$2,000 + 2,200)/2]$ and \$2,310 $[(\$2,200 + 2,420)/2]$ for the second year. Using the straight line method, the depreciation for the first year is \$1,100 and for the second year \$1,155.] The \$2,255 total accumulated current cost depreciation is less than the current cost of the asset, which is expected to be \$2,420 at the date of replacement. This example clearly demonstrates that if replacement cost were increasing continuously over periods of time, the cumulative depreciation would be less than the replacement cost of the asset.

when the current cost increases. It has also been argued that "unless the cumulative capital maintenance adjustment equals the replacement cost of present productive capacity, productive capacity has not been maintained."⁴ A proposed solution to overcome this problem is that "current depreciation expense . . . include not only an amount based on current replacement cost but also an amount sufficient to compensate for expense based on lower replacement costs in previous periods."⁵ Stated differently, for the firm to be able to replace its physical assets using funds retained through depreciation charges, additional amounts for backlog depreciation should be included.

COMPUTATION AND ACCOUNTING FOR BACKLOG DEPRECIATION

Several alternative methods of computing and accounting backlog depreciation are available. In computing backlog depreciation, periodic backlog depreciation is based on the current cost of the asset at the end of the given year or on the average current cost of the year. If it is assumed that the current cost of the asset has increased uniformly over the year, an appropriate procedure in harmony with the matching principle should be to compute the depreciation expense on the basis of the average current price for the year.

Once the depreciation expense and the backlog depreciation are computed, at least four different alternatives to account for the backlog depreciation are available:

1. As a non-operating expense or deduction from net income during the period in which the current cost increases. This approach serves to lower the net income to the extent of the backlog depreciation, which should be shown separate from the regular depreciation expense.
2. As a charge to retained earnings, a correction in effect of prior years' earnings to prevent dividend distributions and other cash outflows from being made to the extent of the higher current costs.
3. As a "revaluation reserve" used to reflect not only the backlog but also the rise in the current cost of the assets.
4. As an offset to realized holding gains, that is, a reduction in the net increase in the current cost of goods sold and depreciation. This procedure has the same net impact on income as Method 1.

⁴ Financial Accounting Standards Board, *Discussion Memorandum on the Conceptual Framework* (Stamford, Conn.: FASB, 1976), 128.

⁵ *Ibid.*

For a numerical example pertaining to backlog depreciation, see Exhibit 1.

To elaborate on the rationale for each alternative method of reflecting backlog depreciation, in reference to Method 1, it would be misleading to combine backlog with the ordinary depreciation expense based on current cost. By segregating the backlog from the current-period depreciation expense, the income statement can be readily modified by the user to reflect a more suitable matching of current costs against current revenues. Backlog is not a current period expense. Additionally, inclusion of backlog in the income statement should put users on notice that cash flows from operations ought to be reduced by backlog funding.

Showing backlog in the retained earnings account and statement as in Method 2 implies that it represents a correction of prior years' income (i.e., a correction of an error, which it really is not). The income of prior periods is not erroneous just because the current cost of the asset(s) in question increase(s) from period to period. Nevertheless, charging backlog to retained earnings avoids the matching problems stemming from inclusion of backlog in the income statement. On the other hand, failure to show backlog in the income statement may well lead various parties to perceive the distributable cash flows generated by the operations of the company to be greater than they actually are.

In the revaluation reserve Method 3, again there is no explicit consideration given to backlog funding (i.e., reducing the net income to allow for physical capital maintenance).

In this situation no attempt is made to reduce distributable earnings to ensure that the total of the asset's replacement cost is retained in the business. Instead it is argued that it is the net book value of the asset which is being restated as this represents the value assigned to the remaining service potential.⁶

In the same vein, Chambers observes, "... The CM [capital maintenance] reserve is a delusion; for it does not secure the provision of the amount of money necessary to maintain operating capacity."⁷

In Method 4, reflection of backlog depreciation as a contra-realized holding gain account in the income statement does not

⁶ D. T. Tweedie, "Current Cost Accounting: U.K. Controversies and Overseas Solutions," in *Readings in Inflation Accounting*, ed. P. T. Wanless and D. A. R. Forrester (Chichester and New York: Wiley, 1979), 446-48.

⁷ R. J. Chambers, "Accounting for Inflation," 1977 Invitational Lecture of Manawater (N.Z.) Accounting Students Society, Massey University, 1977, 141.

affect the normal operating income, yet it serves to disclose backlog in the income statement properly, in contrast to Method 3. Moreover, Method 4 provides a lower net income using current cost, which is more consistent with the distributable cash flows from operations of the firm.

In summary, the case for disclosure of backlog depreciation rests on cash flow implications. To the extent that depreciation charges based on current cost would not enable the firm to replace the assets from funds retained through depreciation charges, an amount representing the shortage ought to be provided for in one form or another. The next question is whether backlog depreciation should appear as an expense, distorting the normal current operating results of the firm and violating the conventional matching principle, or whether it should be treated as an adjustment to retained earnings. Treating backlog depreciation as an adjustment to retained earnings implies that the reported income for the period can be distributed without impairing the operating capability of the firm. Assuming there is a deficit in the retained earnings account, reflecting backlog depreciation in this account would create a greater deficit and an additional impairment of the capital of the firm. There is a similar problem with the procedure of treating backlog depreciation as an adjustment to holding gains.

THE CASE AGAINST BACKLOG PROVISIONS

If a firm has a regular asset replacement pattern, no backlog depreciation should be necessary as long as the depreciation is based on the current cost of the asset at the end of the period. This can be illustrated by the following example. Assume that the firm owns two identical assets, which were acquired in two consecutive years, each at an original cost of \$2,000 and an estimated useful life of two years. Assume that the current cost of these assets increases by 10 percent per year. At the end of the second year when the first acquired machine is to be replaced, its current cost would be \$2,420 [$(\$2,000 \times (1.10)^2)$]. If we now assume that depreciation is computed on the basis of the end-of-year current cost of the asset, the accumulated depreciation for the two assets for the year would be exactly \$2,420, an amount equal to the current cost of the asset at the time the asset is to be replaced. In this situation, there would be no need for backlog depreciation.

In support of the foregoing argument, in its 1976 Discussion Memorandum on the Conceptual Framework, the Financial Accounting Standards Board (FASB) asserts:

Exhibit 1.*

A firm buys a depreciable asset (equipment) having a five-year economic life and costing \$4,000. Each year the current cost of the new asset increases \$500. The depreciation expense is based on the end-of-year current cost. There is no salvage value.

| | Current cost (CC) | CC depreciation expense | Backlog depreciation | Unrealized holding gain | Realized holding gain |
|----------|----------------------|-------------------------------|-------------------------|-------------------------------|-----------------------------|
| 12/31/X1 | \$4,500 | \$ 900 | \$ 0 | \$400 | \$100 |
| 12/31/X2 | 5,000 | 1,000 | 100 | 300 | 200 |
| 12/31/X3 | 5,500 | 1,100 | 200 | 200 | 300 |
| 12/31/X4 | 6,000 | 1,200 | 300 | 100 | 400 |
| 12/31/X5 | 6,500 | 1,300 | 400 | 0 | 500 |

The journal entries that would be made for Methods 1-4 follow:

| Method | Year | | | | |
|--------------------------|------|-------|-------|-------|-------|
| | X1 | X2 | X3 | X4 | X5 |
| 1 | | | | | |
| Equipment | 500 | 500 | 500 | 500 | 500 |
| Depreciation expense | 900 | 1,000 | 1,100 | 1,200 | 1,300 |
| Backlog | | 100 | 200 | 300 | 400 |
| Realized holding gain | 100 | 200 | 300 | 400 | 500 |
| Unrealized holding gain | 400 | 300 | 200 | 100 | 0 |
| 2 | | | | | |
| Equipment | 500 | 500 | 500 | 500 | 500 |
| Depreciation expense | 900 | 1,000 | 1,100 | 1,200 | 1,300 |
| Retained earnings | | 100 | 200 | 300 | 400 |
| Realized holding gain | 100 | 200 | 300 | 400 | 500 |
| Unrealized holding gain | 400 | 300 | 200 | 100 | 0 |
| Accumulated depreciation | 900 | 1,100 | 1,300 | 1,500 | 1,700 |
| 3 | | | | | |
| Equipment | 500 | 500 | 500 | 500 | 500 |
| Depreciation expense | 900 | 1,000 | 1,100 | 1,200 | 1,300 |
| Revaluation reserve | 500 | 400 | 300 | 200 | 100 |
| Accumulated depreciation | 900 | 1,100 | 1,300 | 1,500 | 1,700 |
| 4 | | | | | |
| Equipment | 500 | 500 | 500 | 500 | 500 |
| Depreciation expense | 900 | 1,000 | 1,100 | 1,200 | 1,300 |
| Realized holding gain | 100 | 100 | 100 | 100 | 100 |
| Unrealized holding gain | 400 | 300 | 200 | 100 | 0 |
| Accumulated depreciation | 900 | 1,100 | 1,300 | 1,500 | 1,700 |

* This example is adapted from Ahmed Belkaoui, *Accounting Theory*, 2nd ed. (New York: Harcourt Brace Jovanovich, 1985), 280-81.

... Catch-up [backlog] additions to current expenses are unnecessary as long as an enterprise regularly replaces assets. Thus, if the enterprise ... has five assets instead of one and replaces on the average one each period, current depreciation expense for each period equals the replacement cost of the asset being replaced, and that is all that is required to maintain productive capacity in a going-concern.⁸

In a similar vein, Vancil and Weil contend:

... So long as the firm's acquisitions to maintain physical capacity are made in an amount at least equal to depreciation based on replacement costs, and are made at least as often as that depreciation is computed, then the net assets retained by depreciation based on replacement costs will be sufficient to maintain physical capacity.⁹

This argument is based on the assumption that all funds retained through depreciation are invested in a similar asset with an after-tax return at least as large as the rate of increase in prices of the firm's specific plant assets.¹⁰ Vancil and Weil present this argument in defense of current cost accounting, which has been criticized by Chambers¹¹ for its failure to ensure the maintenance of physical capacity, as its proponents claim.

The foregoing scenario may suggest that backlog depreciation is necessary under less restrictive conditions. However, there would be no need for any backlog depreciation under a comprehensive current cost model that provides current cost adjustments both for "monetary working capital" and non-monetary items. An attempt to account specifically for backlog would, therefore, constitute double counting in Gynther's view. Gynther argues:

... To the extent that:

- a. The non-monetary assets in which the funds retained in the business over the years by those depreciation charges have been reinvested in other non-monetary assets — and they in turn are also being restated; and
- b. losses are being recognized on holding those monetary assets that have *not* been reinvested in other non-monetary assets, ...¹²

⁸ Financial Accounting Standards Board, *Discussion Memorandum*, 128.

⁹ R. F. Vancil and R. L. Weil, "Current Replacement Cost Accounting, Depreciable Assets and Distributable Income," in *Replacement Cost Accounting: Readings on Concepts, Uses and Methods*, ed. Vancil and Weil (Glen Ridge, N.J.: Thomas Horton and Daughters, 1976), 58.

¹⁰ Ibid.

¹¹ R. J. Chambers "NOD, COG and PuPu: See How Inflation Teases!" *Journal of Accountancy* (September 1975), 62.

¹² R. S. Gynther, "CCA: Its Expected Effects," part 1, *Australian Accountant* (April 1978), 158.

then there would be no need specifically to show backlog depreciation in the income statement. Stated another way, if the funds stemming from accumulated depreciation are invested in goods rather than retained as monetary assets, the firm benefits. The value of the goods will increase as their specific prices increase. This will be reflected in higher current cost depreciation, which lowers the distributable income. On the other hand, if the funds arising from depreciation were to be invested in monetary assets, the monetary working capital adjustment would show a holding loss and thereby reduce the distributable income for a given period.

In a recent paper, Bell made similar arguments against any direct or indirect provision for backlog depreciation. In reference to Gynther's argument that the monetary adjustment indirectly allows for backlog depreciation, Bell asks:

... But our question ... is why does anyone wish to make a backlog depreciation adjustment, directly or indirectly, in the first place? The argument is that if accumulated depreciation allowances are put into goods, the value of the assets they go into will, of course, keep up with [price changes for the goods] but if they are put into monetary assets the "holding loss" (as measured by the value of physical assets of the firm) debit against revenues must be credited to the capital maintenance reserve account and in this way backlog depreciation gets into the system by the back door since monetary assets equal to backlog depreciation are retained initially in the firm with the corresponding credit being to the capital maintenance reserve.¹³

With reference to the backlog issue, it is apparent that Gynther and Bell clearly hold the same position: it is unnecessary to reflect backlog in the financial statements.

That the need for backlog depreciation arises in those circumstances where a piecemeal approach to the current cost accounting has been applied should be emphasized. A number of countries, including the United States, have required the disclosure of current cost data without requiring the implementation of a comprehensive current cost model. As has been clearly noted by both Gynther and Bell in the foregoing discussion, there is no need for backlog depreciation under a comprehensive current cost income model which provides current cost adjustments both for monetary working capital and non-monetary items.

¹³ P. W. Bell, *American and Australian Approaches to Current Value Accounting: How Fundamental Are the Differences?* (Australian Accounting Research Foundation, 1982), 37.

BACKLOG DEPRECIATION IN SELECTED INTERNATIONAL PRONOUNCEMENTS ON ACCOUNTING FOR CHANGING PRICES

United States

The latest authoritative price-level accounting pronouncement in the United States, Financial Accounting Statement (FAS) No. 33, does not deal with backlog depreciation. By the FASB's own admission, this is one of those items on which the board has deferred action to reduce the complexity of the statement.¹⁴ In 1984, the FASB subsequently evaluated FAS No. 33, five years after this experimental standard was issued. The only change to date has been to eliminate the historical-cost/constant-dollar requirement for those firms that report current cost and current-cost/constant dollar data in conformity with FAS No. 33.¹⁵ The FASB has indicated that it will issue a statement on current-cost/constant-dollar disclosures. If the forthcoming statement leads to a comprehensive current cost model, the backlog depreciation issue could be a mute question in the United States. On the other hand, if the piecemeal approach is continued, the question of backlog depreciation will remain a debatable issue.

Australia

According to the latest authoritative price-level accounting statement in Australia, *Proposed Statement of Accounting Standard on Current Cost Accounting* (February 1982), which was subsequently released as *Statement of Accounting Practice No. 1* (SAP No. 1) in November 1983, depreciation charges are to be based on the average current cost for the period (which is also the requirement of FAS No. 33). According to SAP No. 1, no provision is necessary for backlog depreciation. The funds are considered to be retained from depreciation charges and are expected to be reinvested and therefore to yield sufficient returns to offset the need for any backlog provisions. Interestingly enough, the National Council of the Australian Society of Accountants and the Institute of Chartered Accountants in Australia, the two organizations responsible for the issuance of SAP No. 1, appear less concerned of ensuring the availability of sufficient funds to finance the replacement of specific assets as the following indicates:

... Where funds are reinvested as a result of a non-cash charge, the

¹⁴ Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 33, "Financial Reporting and Changing Prices"* (Stamford, Conn.: FASB, 1979), 28.

¹⁵ See Financial Accounting Statement No. 82, "Financial Reporting and Changing Prices: Evaluation of Certain Disclosures" (Stamford, Conn.: FASB, 1984).

resources generated will also be subject to normal CCA procedures. Then procedures will measure profit based on total operating capability as it exists after making reinvestments. Whether or not they ensure sufficient funds are available to finance the replacement of specific assets is irrelevant, *since CCA is not designed for this purpose* (although it may assist). [Emphasis added.]¹⁶

According to an Omnibus Exposure Draft issued in March 1980 by the Australian Accounting Research Foundation, the Australian current cost accounting (CCA) system is "not concerned with replacing assets but rather with the determination of profit in a way that, in meaningful economic terms, measures increments or decrements in operating capability."¹⁷ This position is reaffirmed in the statement. According to an earlier Statement of Provisional Accounting Standard (DPS 1.2), however, backlog depreciation was to be reflected in the "current cost adjustment account."¹⁸

Support for the latest position of the Australian accounting profession, which entirely ignores any provision for backlog depreciation on the grounds that CCA is not designed to ensure availability of sufficient funds for asset replacement, is also provided by Clarke. He argues:

The problem of funding asset replacements or repairs to existing assets so that physical capital may be maintained is a financial matter, not an accounting one. The financial consequences of inflation may well make . . . asset replacement more costly. But that does not mean that accounting to incorporate the financial effects of inflation need pay any particular attention to those problems, as such.¹⁹

The argument that CCA is not designed for the purpose of ensuring availability of sufficient funds for asset replacement could be challenged for lack of consistency. Chambers, for instance, maintains that it is "hypocritical" to justify CCA on the basis of sustaining operating capacity and then to assert, regarding the

¹⁶ Guidance Notes to the Australian *Proposed Statement of Accounting Standards in Cost Accounting*, par. 66 (February 1982). It should be noted that a standard on accounting for changing prices has never been issued in Australia.

¹⁷ Australian Accounting Research Foundation, Exposure Draft, "Current Cost Accounting — Omnibus Exposure Draft" (AARF, 1980), par. 25.

¹⁸ See The Institute of Chartered Accountants in Australia and Australian Society of Accountants, Explanatory Statement, "The Basis of Current Cost Accounting" (DPS 1.2/309.2) (October 10, 1976, amended August 1976), par. 13.25 and 13.26.

¹⁹ F. L. Clarke, "CCA: Progress or Regress?" in *Current Cost Accounting: Identifying the Issues*, ed. G. W. Dean and M. C. Wells, 2nd ed. (Lancaster, England: International Center for Research in Accounting, University of Lancaster, and Sydney, Australia: Department of Accounting, University of Sydney, 1979), p. 70.

issue of the need for backlog depreciation, that capital maintenance is the concern of financial managers, not of accountants.²⁰

The stated objectives of SAP No. 1 do not contain any explicit reference that would make backlog depreciation relevant information. Paragraph 4 of the 1982 Australian Proposed Statement asserts that "the objective of CCA is to ensure that, having regard to changes in specific prices, the results and resources of an entity are realistically measured so as to be of maximum value to users." This statement says nothing about ensuring sufficient funds for asset replacement, and, to the extent that the periodic income is measured using current cost, one can contend that the objective of communicating realistic measures of the firm's performance has been accomplished. There is still, however, one troublesome point. Another objective (para. 7) of the Proposed Standard states that the "CCA assists investors, managers and other users in better assessing . . . the *financial viability* of the entity." Granted that backlog depreciation represents potential cash outflow at the time of replacement, does it not constitute relevant information in assessing the financial viability of the entity? It can be argued that users who are interested in making future cash flow projections would find information pertaining to backlog depreciation relevant. However, there would be no need for any backlog depreciation if all pertinent data were already impounded in a "complete" current cost income model. As Gynther has stated, any attempt to account specifically for backlog would constitute double counting.²¹

Canada

On the subject of backlog depreciation, the 1982 Canadian pronouncement on "Reporting the Effects of Changing Prices" states in Appendix A:

When an enterprise has a pattern of asset replacements that is subject to significant irregularities, backlog depreciation may become a material factor to be considered by users in assessing maintenance of operating capability. In such circumstances, management may wish to comment on the significance of backlog depreciation in its narrative discussion of the supplementary information.²²

According to the Canadian pronouncement, any increases or decreases in the current cost amounts of physical productive assets

²⁰ Ibid.

²¹ Ibid., 158.

²² Canadian Institute of Chartered Accountants, *CICA Handbook, Section 4510*, "Reporting the Effects of Changing Prices" (Toronto: CICA, 1982), Appendix A, paragraph A.15.

that arise from price changes represent changes in the amount of capital required to maintain the operating capability of the firm. Consistent with a stated objective of the standard that requires disclosure of pertinent data to assist users in assessing the extent to which the enterprise is able to maintain its operating capability, increases and decreases in the current cost amounts of property, plant, and equipment due to price changes are disclosed separately. The Canadian pronouncement does not include "holding gains and losses" on non-monetary items as components of income. Any backlog depreciation is accounted for in arriving at the net change in current cost of the physical assets.²³

The Canadian approach considers only current cost depreciation in arriving at income attributable to common shareholders. Thus, although interested users can determine the backlog depreciation from the supplementary information, no attempt is made to retain

²³ The method of dealing with backlog depreciation is further discussed in Appendix B, par. B.27, of the Canadian pronouncement, Section 4510: "The increase in the current cost of property, plant and equipment can be determined simply as the balancing item in an account that reflects all entries at current cost. An alternative is to work with gross balances and accumulated depreciation, thus determining the gross amount of holding gains and the amount of the 'backlog depreciation' adjustment arising in the year. Each alternative is shown in the following table:

| | 000s | | |
|---|-----------------------|-----------------------------|---------------------|
| | Gross current cost | Accumulated depreciation | Net current cost |
| Balance at December 31, 1980 | \$148,000 | \$91,800 | \$56,200 |
| Disposals during the year | 5,000 | 3,000 | 2,000 |
| Depreciation expense | | (13,750) | 13,750 |
| Additions during the year | (12,000) | | (12,000) |
| Balance at December 31, 1979 | (122,000) | (71,000) | (51,000) |
| | 19,000 | | |
| 'Backlog depreciation' adjustment | 10,050 | \$10,050 | |
| Net increase in the current cost of property, plant and equipment | \$8,950 | | \$8,950 |

"The method used in the above illustration to deal with backlog depreciation results in an appropriate matching of the current year's depreciation expense (\$13,750,000) with the current year's revenues. In addition, the gross current cost of property, plant and equipment (\$148,000,000) together with accumulated depreciation (\$91,800,000) is correctly reported. It should be noted, however, that accumulation of each year's net increase in the current cost of property, plant and equipment (\$8,950,000) will not result in a reserve that is equal to the gross current cost of the assets at the end of their useful lives. To ensure full provision for the gross current cost of assets, an amount equal to backlog depreciation (\$10,050,000) needs to be appropriated from retained earnings."

an amount equal to the backlog depreciation from the income attributable to common shareholders to ensure the availability of sufficient funds for the replacement of physical productive assets. The Canadian approach is similar to the Australian approach, which attempts to resolve the backlog depreciation issue by disclosing a comprehensive set of supplementary current cost data.

United Kingdom

According to *Statement of Standard Accounting Practice No. 16: Current Cost Accounting* (SSAP No. 16), the amount of depreciation charge applied in computing the "current cost operating profit" reflects the amount of fixed assets consumed during the period based on the value of these assets to the business. No provision is made for any backlog depreciation in arriving at the current operating income. SSAP No. 16 does not provide a comprehensive current cost model to the extent that it ignores the impact of general inflation.

Although SSAP No. 16 is not specific on how backlog depreciation is treated, according to the Sandilands Report, which had advocated the adoption of current cost accounting in the United Kingdom in 1975, backlog depreciation should be treated directly as an adjustment to the "fixed assets revaluation reserve with the corresponding credit to the cumulative depreciation."²⁴ This report admits that adjusting backlog depreciation to the revaluation reserve account instead of charging it to the income statement does not serve to retain funds to provide for the full replacement cost of the physical assets unless, of course, the assets are replaced on a regular, revolving basis.

CONCLUSION

The entire issue of backlog depreciation stems from the concern in physical capital maintenance to ensure the availability of sufficient funds to replace the physical productive assets of the firm. A study of this subject, however, suggests that little justification for this concern exists for two principal reasons. First, as long as the firm replaces its assets in a regular, orderly pattern, the problem of backlog depreciation should not arise because the firm would reflect accumulated depreciation equal to the latest current cost of the fixed assets in question. Second, as long as the funds retained from depreciation charges are prudently invested, no need for reflecting backlog depreciation in the financial reports should exist.

²⁴ *Inflation Accounting, Report of the Inflation Accounting Committee* (London: Her Majesty's Stationery Office, 1975) par. 480-82.

To recognize what might be achieved by adopting a system of current cost accounting is important. A key objective of current cost accounting in the measurement of periodic income is to ensure the maintenance of the operating capability of the firm by matching against revenues the current costs of the service potential of assets consumed in earning revenues. Having accomplished this objective, the authors believe that concern as to whether sufficient funds are available for replacing certain assets should be a financing problem, not an accounting issue.

The Effectiveness of the Supreme Audit Bureau in Kuwait in Monitoring Public Expenditures: An Evaluation

WAJDY SHARKAS*

Kuwait is a capital-oriented economy. Most of its capital is generated by oil revenues. Oil receipts constituted 91 percent of total government revenues for the fiscal year 1982 to 1983. The oil sector contributed approximately 48.2 percent of the gross domestic product at current prices for 1982 (an average 66.5 percent for the period 1971 to 1981). Oil exports provided approximately 115 percent of the total financing requirements of the Kuwait imports for 1982.¹

Until 1946, when the exploration and development of its petroleum reserves occurred, Kuwait ranked among the poorest nations in the world. Until then, its economy was characterized by a very low per capita income (as low as \$21 annually), low annual savings, a near zero growth rate, labor intensive environment, and a single-source economy linked with the sea — mainly pearling, fishing, and re-export trade.²

Today, Kuwait, in contrast to the pre-oil era, ranks near the top in terms of national per capita income and has one of the highest saving rates, a well-developed economic infrastructure, free government services in the areas of health and education, and a highly generous social welfare system.

A review of the performance of the Kuwaiti economy during

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¹ Central Bank of Kuwait, *Economic Report 1983* (Kuwait: CBK, June 1984), 25.

² S. M. Al-Sabah, *Development Planning in an Oil Economy: The Case of Kuwait* (London: Eastlord Publishing, 1983), 40–41.

the seventies indicates that its growth rates were high and relatively stable, averaging 9 percent despite the slowdown in 1977 caused by sluggishness in oil production.³ This steady growth rate is attributed to increasing government domestic expenditures of the following types:

1. Current expenditure: on goods and services, including salaries and wages paid to civil servants, as well as transfer and subsidies to the household sector;
2. Capital expenditure: public expenditures on infrastructure including public investment in education, health, and housing for low-income groups;
3. Expenditures for land acquisition: classified as public capital expenditures;
4. State payments to domestic establishments: loans, subscriptions, and subsidies; and
5. Transactions in public reserves: additions to or subtractions from public reserves.⁴

To keep pace with the growth in population and to meet local and foreign demand, the government is increasing its expenditures annually on a steady base through the eighties. This occurred despite several local and foreign developments in the Kuwaiti economy which resulted in the present state of slowdown as indicated in Exhibit 1.

The nature of the Kuwaiti economy, with several problems of imbalance, poses a problem for the government in the eighties. These problems stem from (1) the instability of the main source of income in Kuwait (as mentioned previously, the primary product in the generation of income is oil, the sales of which are determined by world demand, while the price is largely determined by market considerations); (2) limited economic absorption capacity due to the relatively small size of the economy; (3) a high dependency on imports; a distinguishing feature is the fact that Kuwait has the highest per capita imports in the world;⁵ (4) a heavy dependency on expatriate labor — more than 75 percent of the total labor force;⁶ and (5) the absence of a comprehensive national economic plan.

³ Ragaei El-Mallakh, *Kuwait: Trade and Investment* (Colorado: Westview Press, 1979) 84.

⁴ Al-Sabah, *Development Planning*, 79–80.

⁵ El-Mallakh, *Kuwait: Trade and Investment*, 73.

⁶ The Economist Intelligence Unit, *Quarterly Economic Review of Kuwait* (December 1983), 7.

Exhibit 1. Summary of Government Financial Transactions
(Million dinars)*

| Fiscal year | Revenues | | | Expenditure and allocations | | | Surplus or deficit |
|----------------------|----------|--------------------|--------|--|--|-----------------------------------|--------------------|
| | Oil | Other ¹ | Total | Govt. ministries' & depts' expenditures ² | Allocations for future generations reserve | Payment to capital of Kuwait Fund | |
| 1976/77 | 2598.3 | 108.0 | 2706.3 | 1377.9 | — | 50.0 | 1278.4 |
| 1977/78 | 2575.3 | 137.0 | 2712.3 | 1753.4 | 221.2 | 50.0 | 687.7 |
| 1978/79 | 3036.1 | 249.3 | 3285.4 | 1728.3 | 328.5 | 50.5 | 1178.6 |
| 1979/80 | 5940.5 | 205.1 | 6145.6 | 2293.2 | 614.6 | 50.0 | 3187.8 |
| 1980/81 | 4434.2 | 241.6 | 4675.8 | 2702.8 | 935.0 | 50.0 | 988.0 |
| 1981/82 | 2764.1 | 244.5 | 3008.6 | 2813.8 | 854.8 | 75.0 | — 735.0 |
| 1982/83 | 2934.6 | 267.5 | 3202.1 | 3248.3 | 260.2 | 30.0 | — 936.4 |
| 1983/84 ³ | 2787.6 | 249.4 | 3037.0 | 3276.3 | 303.7 | 30.0 | — 673.0 |
| 1984/85 ⁴ | 2912.0 | 315.0 | 3227.0 | 3654.0 | 323.0 | 30.0 | — 780.0 |

¹ Excluding investment income² Excluding the Suspense Account³ Budget after approval by National Assembly⁴ In draft state budgetSource: Central Bank of Kuwait, *Economic Report* 1983, 35. 1984/85 figures from The Economist Intelligence Unit, *Quarterly Economic Review of Kuwait* (London, 1984), 8.

* \$1 = KD 0.301

The problems caused by the disequilibrium in the Kuwaiti economy have been accentuated in the eighties and have forced the government to relate expenditures to the actual needs for development in the country rather than to the available revenues. This policy was incorporated in the draft budget of fiscal year 1983/84. The government defined the main features of its fiscal policy as:

1. The adoption of a circumspect policy in the national fiscal budget;
2. The rationalization of public expenditures — a rationalization intended to optimize economic and social returns in relation to the expenditures;
3. Improvement in efficiency and the encouragement of productivity in government administration;
4. Diversification and an increase in the sources of budgetary revenues through a comprehensive study of all sources; and
5. Significant support for the private sector based on sound economic foundations so that this sector can play a significant role in developing, balancing, and supporting the national economy and national finance.⁷

As mentioned, Kuwait is heavily dependent on oil revenues for its development. The very survival of the country as opposed to the mere survival of its citizens depends on the achievement of the goals of the new national fiscal policy. Stated differently, Kuwait is dependent on the efficiency and effectiveness of government transactions in determining whether governmental expenditures are spent wisely. This role, by its very nature, would be expected to be assigned to the Audit Bureau.⁸

GOVERNMENT FINANCIAL MANAGEMENT

Despite the fact that the governmental financial management system is service and responsibility oriented rather than profit oriented, it has many of the basic characteristics of any other organization. A comprehensive government financial management system (budgetary processes, accounting systems, financial reports, and audits) is intended to assure the optimum use of resources, both internal and external, in compliance with applicable laws and legal requirements and to provide users with the needed data and information.

⁷ Central Bank of Kuwait, *Economic Report 1983*, 28–29.

⁸ The Audit Bureau is the supreme audit institution in Kuwait.

Users require information about the amount of spending for various programs, activities, and even items of expenditures. Importantly, the amount spent does not necessarily measure the quantity and quality of services provided, but it does permit rudimentary comparisons of one organization's service level and composition with that of another organization.⁹

Outside the formal governmental organization and legislative bodies are three major groups of users whose interests and decisions are dependent on financial information produced by the government financial management system. The first group includes the general public which is vitally concerned with the adequacy of revenues to meet the cost of public services and the stewardship and efficiency of both elected and appointed public officials in administering the government's resources. The second group includes investors, investment banks, and bond rating services, which are interested in the financial status and operating results of governmental units. The final group includes educational and research organizations, statistical reporting establishments, and such persons whose professional activities embrace the study of the government financial management.¹⁰

THE NATURE OF THE PROBLEM

It is generally recognized that developing countries, including Arab states, as a rule have ineffective government financial management systems. Little attention has been given to sound accounting and auditing practices, budgeting systems, and comprehensive training programs for audit staff and financial managers.¹¹

Government accounting in developing countries lacks the integrated financial information produced in a timely manner. Internal control procedures and post-transaction auditing practices are minimal or non-existent, and productivity appraisals are often ineffective. Budget systems are not integrated with accounting systems, which results in insufficient financial information to compare with budget items, and comparisons of planned and actual

⁹ Ernst and Ernst, *Accounting by Non-Business Organizations: FASB Discussion Memorandum* (August 1978), 13.

¹⁰ The National Committee on Governmental Accounting, *Governmental Accounting, Auditing and Financial Reporting* (Chicago: NCGA, 1968), 1-2.

¹¹ U.S. General Accounting Office, *Report to the Congress on Training and Related Efforts Needed to Improve Financial Management in the Third World* (Washington, D.C.: U.S. GAO, 1979), 1. For an outstanding study on governmental auditing in the Arab States, see Naim H. Dahmash, "Public Auditing Developments in the Arab States: A Comparative Study," *International Journal of Accounting* (Fall 1982), 89-114.

financial performance cannot be made. Auditing staff and financial managers lack the specialized technical training essential to manage properly the development process.¹²

Consequently, the supreme audit institution's role in developing countries has become more and more one of identifying opportunities for improvements in government financial management systems and suggesting means to ensure the accountability of public funds, the reliability of financial information, and the credibility of financial reports. Moreover, the audit institutions should determine whether governmental funds are handled in compliance with applicable laws and regulations and whether governmental units are achieving the purposes for which the funds are made available in an efficient, effective, and economical manner.¹³

PURPOSE OF THE STUDY

The purpose of this study is to examine and evaluate the effectiveness of the role of the Audit Bureau in Kuwait. Emphasis will be placed on its objectives, functions and responsibilities, organization and staffing, disciplinary measures for financial violations, and types and scope of audits and reporting. This study will also recommend appropriate ways to improve the Audit Bureau's effectiveness in determining whether governmental programs and activities are being conducted efficiently, effectively, and economically.

LIMITATIONS OF THE STUDY

This study will not examine the budgetary processes, accounting systems of different governmental units, financial reporting systems, or the link between planning and budgeting process. It will be concerned mainly with an evaluation of the role of Kuwait's Audit Bureau relative to the goals of the new fiscal policy adopted since the fiscal year 1983/84 in monitoring public expenditures. To appreciate fully the role of the Audit Bureau, the author stresses the fact that "the economy of Kuwait is dominated by government activity, and acutely sensitive to any change in government disbursements of funds."¹⁴ The government dominates, now and in the foreseeable future, sources of national income and major industrial projects.

¹² Ibid.

¹³ U.S. General Accounting Office, *Standards for Audit of Governmental Organizations, Programs, Activities and Functions* (Washington, D.C.: GAO, 1972), i.

¹⁴ Rajai M. Abu-Khadra, "Review of the Kuwaiti Economy," *OPEC Review* (Summer 1979), 46.

Each of the subjects not examined in this study needs a special investigation and further research. They might be appropriate topics for separate studies.

ESTABLISHMENT AND OBJECTIVES OF THE AUDIT BUREAU

The Audit Bureau was established in 1964 (by Legislative Act No. 30) as an independent commission organizationally attached to the National Assembly (Kuwait's legislative body) to achieve effective control over public funds. The Bureau exercises control over the collection of state revenues and expenditures within the limits of the budget allocations and examines the adequacy of the regulations and methods adopted for the safeguarding of public funds and the prevention of their abuse.¹⁵

The Bureau control includes the accounts of (1) the ministries, departments, and public organizations which constitute the administrative system of the state; (2) the municipalities and all other local bodies which have a public legal entity; (3) the public commissions, bodies, establishments attached to the state and the municipalities, or other local bodies which have a public legal entity; (4) the companies or establishments in which the state or any other public legal entity holds a share of not less than 50 percent of the capital or guarantees a minimum profit; and (5) the bodies, including the National Assembly, which have independent or supplementary budgets.¹⁶

FUNCTIONS AND RESPONSIBILITIES

In the course of exercising control over revenues, the Bureau examines, reviews, and inspects documents, books, and registers of public collections and entitlements to ascertain that the financial dispositions and account entries pertaining to collection have been performed in a proper and regular manner in accordance with the financial and accounting by-laws. The Bureau, in particular, must ascertain that vouchers or other documents reporting receipts of public revenues and entitlements have been reviewed and checked by the official staff, and that statements submitted by the various state organizations report the amount of public revenues and entitlements which have been collected.¹⁷

In respect of expenditures, the Bureau examines, reviews, and

¹⁵ State of Kuwait, Law No. (30) Regarding the Establishment of Audit Bureau, *The Official Gazette* (7 July 1964), Articles (1), (2) and (6).

¹⁶ *Ibid.*, Articles (5) and (6).

¹⁷ *Ibid.*, Article (8).

inspects the payment vouchers, registers, and books to ascertain that the financial dispositions and accounting entries pertaining to disbursements have been performed in a proper and regular manner in accordance with the provisions of the financial and accounting by-laws and the general rules of the budget. The Bureau, in particular, must ascertain that (1) the amount expended against each item of the budget corresponds with amounts entered in the documents, (2) the allocations made for each chapter or item of the budget have not been exceeded without prior permission, (3) the amounts expended as charges against the allocations made for development projects have been expended in the manner prescribed, (4) no commitment has been made by any department in such a way as to lead to exceeding the allocated amount in its budget, and (5) the correct implementation of the provisions of the laws in respect of the budget has been performed.¹⁸

The Bureau must examine and review personnel orders on appointments, promotions, increments, settlements, allowances, additional salaries, and similar items, as well as travel allowances and transportation expenses to ascertain that such orders conform with the rules of the budget, other financial provisions, by-laws, and the relevant orders. The Bureau also must examine and review the accounts of pension funds, service benefits and insurance, and social security and aid payments, and verify that they conform with the laws, by-laws, and applicable orders.¹⁹

Supplies and public works tenders, where the value of each is 100,000 dinars or more, are subject to the Bureau's prior control. In determining such value, consideration shall be given to the gross value of the articles or works under tenders calculated on the basis of minimum prices of tenders fulfilling the conditions required. The Bureau must decide the matter and notify the authority concerned within a period not exceeding seven days from the date of receipt of the tender documents in full and duly completed. The role of the Bureau is to ascertain that the allocation in the budget allows commitments or contractions and that all procedures necessary to be fulfilled have been observed.²⁰

The Bureau must inspect all transactions of the public stores and warehouses and their various branches and examine their documents, books, registers, and accounts; investigate the reasons for cases of embezzlement, negligence, and loopholes in the stand-

¹⁸ Ibid., Article (9).

¹⁹ Ibid., Articles (10) and (11).

²⁰ Ibid., Article (13).

ing work systems which caused or facilitated their happening and suggest corrective measures. Moreover, the Bureau must examine the manner in which the state funds are invested and examine the administrative, financial, and accounting by-laws to ascertain their adequacy and suggest ways to improve them.²¹

The Bureau is required to audit the accounts of all corporations or establishments in which the state or any other public entity holds not less than a 50 percent share in their capital or guarantees them minimum profit. The Bureau's audit extends to companies licensed to utilize or manage any of the public utilities or those granted a concession to utilize any of the natural resources in the state. For corporations, the audit scope includes the reports of their independent certified auditors and of their boards of directors.²²

ORGANIZATION AND STAFFING

The organizational framework of Kuwait's Audit Bureau follows the administrative classifications of the government. The Bureau is composed of a president, an undersecretary, an associate undersecretary, and an adequate number of auditors (technical staff). Subject to the work requirement of the unit, a vice-president and more than one undersecretary and associate undersecretary may be appointed.²³

The president of the Bureau is appointed by an amiri decree upon nomination of the speaker of the National Assembly after approval of such nomination by the Assembly in a secret session and the approval of the Council of Ministers. The functional level of the president of the Bureau is equivalent of the level of a minister; he may not be dismissed except with approval of the majority of constituent members of the National Assembly or by the order of the assigned disciplinary authority.²⁴ No educational requirements are stipulated by law for the president of the Audit Bureau but, in practice, all presidents have been college graduates.

The undersecretary and associate undersecretary of the Bureau are appointed by amiri decrees upon nomination of the president of the Bureau and approval of the speaker of the National Assembly and the Council of Ministers. Their function is to assist the president in organizing and managing the Bureau.²⁵

²¹ *Ibid.*, Articles (16), (17), (18), (19), and (20).

²² *Ibid.*, Articles (23) and (24).

²³ *Ibid.*, Article (3).

²⁴ *Ibid.*, Article (35).

²⁵ *Ibid.*, Articles (38) and (39).

Selection and Training of Technical Staff

The technical staff (auditors) should hold a university degree in law or in commerce, or the equivalent, from a university recognized by the Ministry of Education in Kuwait. Grades and salaries in all groups of posts for technical staff are appended to the civil service law; that is to say, there are no special financial incentives or rewards for the Audit Bureau's technical personnel. The size of the technical staff is determined by the president of the Bureau depending upon the amount of work and the constraints of the Bureau's budget.²⁶

No specific standards exist in respect to staff training. In general, the Bureau does not offer any training programs to develop the technical capabilities of the personnel. Occasional programs, when offered, are conducted through specialized training institutions.

DISCIPLINARY MEASURES FOR FINANCIAL VIOLATIONS

Appropriate disciplinary measures are taken against all civil employees responsible for any financial violation. All authorities subject to the control of the Bureau are required to investigate any financial violation and offer a decision in the case — either take no action, administratively discipline the person responsible, or refer him to disciplinary trial, as appropriate.²⁷

The Audit Bureau must be notified of the decisions in all cases of financial violations and must be presented the investigation file and other relevant papers and documents within a period not exceeding ten days from the date of such decisions. The Bureau has the right to object to such decisions. In such a case, the president of the Bureau, instead of the tribunal which has jurisdiction, may institute disciplinary proceedings against the offender within a period not exceeding one month from the date the Bureau received the decision to which there is an objection.²⁸

TYPE AND SCOPE OF AUDITS

The Bureau is required to review all documents pertaining to authorities subject to its control — a detailed and total audit. An exception to this general rule is the president of the Bureau who, in cases of extreme necessity, permits the use of sampling auditing techniques provided that the documents examined may not in any way be less than 50 percent of any kind of document pertaining

²⁶ Ibid., Articles (42) and (43).

²⁷ Ibid., Articles (53) and (54).

²⁸ Ibid., Article (57).

to any authority. Further, he must revert to the original detailed total audit when the reasons which called for the audit sampling cease to exist.²⁹

Concerning secret expenditures audit, every three months the minister concerned signs a declaration containing a statement of the amount spent during such period from the secret expenditures allocated in the budget of his ministry and issues a certificate to the effect that the amount was spent within the limits of the allocation established and for the purpose for which they were allocated.³⁰

The financial statements of the organizational unit under the authority of the Audit Bureau's control and engaged in commercial or industrial activities are audited by the Bureau in accordance with generally accepted auditing standards as they are practiced in auditing the financial statements of the private sector in Kuwait.³¹

REPORTING

The Audit Bureau, through its president, must prepare at the end of each fiscal year an annual report for each financial statement of the state, and the public units whose budgets are regulated by laws. The annual report contains the findings and conclusions of the audits, comments, suggestions, and differences between the Bureau and the authorities subject to its financial control. The report is submitted to the head of the state, the National Assembly, the Council of Ministers, and the Minister of Finance.³²

During the fiscal year, the president of the Bureau may submit other reports on matters which, in his opinion, are of importance, or on matters entrusted to the Bureau for examination by the National Assembly or the Council of Ministers.³³

EVALUATION OF GOVERNMENTAL AUDITING IN KUWAIT

The Kuwaiti economy, in recent years, has been characterized by a surge in government domestic expenditures financed by oil sector receipts. Estimated governmental expenditures for the fiscal year 1984/85 are almost three times more than expenditures in the fiscal year 1976/77, and almost thirteen times more than in the fiscal year 1970/1971.

The Kuwaiti annual budgetary surplus has become a thing of

²⁹ Ibid., Articles (78) and (79).

³⁰ Ibid., Article (80).

³¹ Ibid., Article (81).

³² Ibid., Articles (21) and (22).

³³ Ibid., Article (25).

the past as rising government expenditures and domestic demands take a larger share of revenues.³⁴ Deficit financing has appeared in the annual budget since fiscal year 1981/82. This dilemma is reflected in the country's fiscal policy and governmental procedures. The current pressure is to ensure that governmental expenditures are channeled in a manner to do the most good at the least expense.

The role of the Audit Bureau in monitoring government expenditures is limited to post-control voucher audits of governmental transactions. The voucher audits are primarily concerned with the legality of transactions — to determine whether transactions are properly conducted in accordance with the budget constraints and are in compliance with pertinent laws and regulations. No attention is given, however, to the proper evaluation of internal control, economy, efficiency, or program and activity results.

This level of governmental expenditures audits was stressed and confirmed in a comment by the president of the Audit Bureau regarding the number of vacant apartment units rented by the government to house the non-Kuwaiti civil employees. His comment was published in a daily newspaper as an official statement (November 1984):

It is beyond the Audit Bureau functions and responsibilities to check if these rented apartment units are being used for the purpose they are rented for. The Bureau's responsibilities are only limited to make sure that the amounts of rent for the vacant apartment units were in line with budget constraints.

This clear contradiction between the recent governmental objectives to monitor public expenditures, to optimize their economic and social return, and to improve the efficiency and the effectiveness of the administration's activities and programs and between the level of audits performed by the Audit Bureau is due to many factors which can be grouped into two categories. The first is environmental and the second may be called technical.

The environmental factors, which indirectly contribute to the contradiction previously mentioned, are related basically to the economic growth, an increasing surplus in the national accounts, an inadequate indigenous supply of technical manpower, the heavy concentration of private wealth in a few families, the social structure, the inter-societal interactions, and the special interest groups. Although these factors are beyond the scope of this study, they

³⁴ Budgeted revenues do not include income from overseas investment, which is reinvested in reserve assets.

should be recognized to understand the causal reasons for the governmental audit deficiencies.

The technical factors which directly cause the contradiction, for the purpose of this study, are those which relate immediately to the Audit Bureau and the audit level performed. This category includes the following factors: legislative requirements, competency of the technical staff, generally accepted auditing standards, and comprehensive auditing.

Legislative Requirements

A review of the articles pertaining to Law No. 30 (1964) establishing the Audit Bureau clearly reveals that the functions of the Bureau, as stipulated by the legislation, are strictly based on the concept of custodial accountability to ensure the safeguard of public funds and that amounts paid by the government for an activity are in accordance with the legal limitations.

Legislative requirements completely neglected the concept of accountability relating to the efficient and effective use of funds. No provisions were stipulated in the law to determine whether public funds were used economically and efficiently to achieve the desired results or benefits, or whether the governmental units had considered alternatives which might yield the desired results at a lower cost.³⁵

The concept of accountability for the efficient and effective use of funds has been overlooked, as a general rule, in the countries of the Third World. A study by the U.S. General Accounting Office (GAO) stated:

. . . in a number of developed and developing countries, audit institutions have been set up by national legislatures, independent of executive branch of the government, to aid the legislatures in performing these [auditing] tasks. The traditional concepts of control and accountability were, however, somewhat narrowly defined in terms of verifying whether the government transactions were in accordance with the sanctions of the legislatures. Consequently, audit functions were limited and concentrated on checking the financial correctness and legal propriety of government transactions.³⁶

This narrow definition of accountability applied in auditing the governmental expenditures of Kuwait, in addition to the legislative requirements of a detailed, complete voucher audit requires most of the technical staff members to perform routine reviews of the numerical accuracy of records and the related documents and of

³⁵ U.S. General Accounting Office, *Standards for Audit*, 2.

³⁶ U.S. General Accounting Office, *Report to the Congress*, 10.

the legality of transactions, with no attention given to review of the adequacy of financial controls, management systems, program evaluations, or the economy and efficiency of operations.

Competency of the Technical Staff

The qualifications and training of the auditing staff should be commensurate with the public's expectation of greater accountability over public funds. Auditors must possess a wide variety of skills compatible with variations in the purpose and scope of audits. Requirements were set for the technical staff members to ensure that government audits were conducted by professionally skilled personnel. These requirements were stated by the GAO:

1. A basic knowledge of auditing theory and procedures and the education, ability, and experience to apply such knowledge to the type of auditing work required for task at hand;
2. A basic knowledge of governmental organization and operation. This knowledge may be acquired by appropriate education, study, or experience;
3. Skills appropriate for the work required in the audit. For auditing financial reports which lead to an opinion, the auditor must be proficient in accounting. . . . For other types of auditing work, the skills of the auditors must be appropriate for the work to be done. For instance:
 - a. If the work requires use of statistical techniques, the audit staff must include persons having the appropriate statistical skills. These skills may be possessed by staff members or by consultants to the staff;
 - b. If the work requires extensive review of computerized systems, the audit staff must include persons having the appropriate computer skills. These skills may be possessed by staff members or by consultants to the staff;
 - c. If the work involves review into complex engineering data, the audit staff must include persons having the appropriate engineering skills. These skills may be possessed by staff members or by consultants to the staff.³⁷

According to the professional proficiency requirements of the GAO, the technical staff, as a whole, of the Audit Bureau in Kuwait is considered highly incompetent. Legislative requirements limit the selection of auditors to university graduates with degrees in law or commerce. No provisions have been stipulated to appoint consultants to the staff or to employ needed specialists, such as computer scientists, engineers, or medical and agricultural specialists to ensure proper and effective audits of governmental expenditures.

The legislative limitations regarding the qualifications of auditors are incompatible with the ever-increasing percentage of govern-

³⁷ U.S. General Accounting Office, *Standards for Audit*, 16.

mental capital expenditures for economic infrastructure, public investments in education and health, land acquisition, and housing for low income groups. Capital expenditures ranged between 20 to 25 percent of total governmental expenditures during the last seven fiscal years.³⁸ In this context, it is fair judgment to decide that auditors with university degrees in law and commerce do not necessarily possess the skills to audit the activities and operations related to this category of public expenditures.

Professional training for technical staff members in governmental auditing activities has been internationally recognized as a means to develop auditing skills. Professional training in Kuwait is a completely neglected area of education. No training programs have been instituted by the Audit Bureau to develop the educational background and capability of staff members.

Generally Accepted Auditing Standards

Improvements in budgeting, accounting, and financial reporting would not ensure the effectiveness of a governmental financial management system without being assured by the audit process that the system is working as intended. "Without audit, no accountability; without accountability, no control; and if there is no control, where is the seat of power?"³⁹

In the United States, considered a leader in this area, efforts to develop generally accepted auditing standards for governmental auditing (GAASGA) can be traced to the recommendations of the Hoover Commission on the organization of the executive branch of the government in the 1950s.⁴⁰ In 1972, the GAO issued a set of GAASGA in the pamphlet, "Standards for Audit of Governmental Organizations, Programs, Activities and Functions," now better known as the GAO "Yellow Book." A slight revision was made to the GAASGA in 1974 and a second more detailed revision was made in 1981. This last revision was designed to:

1. Expand the explanation of some standards.
2. Separate the standards for financial and compliance audits from those for economy and efficiency audits and program results audits.
3. Incorporate standards relating to audits in which automatic data processing systems are used by the entity.

³⁸ Central Bank of Kuwait, *Economic Report 1983*, 159.

³⁹ W. J. M. Mackenzie, "Worth Repeating," *International Journal of Government Auditing* (January 1974), 16, quoted in Dahmash, "Public Auditing Developments," 91.

⁴⁰ Felix Pomeranz, "Public Sector Auditing: New Opportunities for CPAs," *Journal of Accountancy* (March 1978), 49.

4. Add a standard to make more specific the auditor's responsibility for detecting fraud and abuse in governmental programs and operations.⁴¹

The GAASGA incorporate the generally accepted auditing standards (GAAS) of the American Institute of Certified Public Accountants developed for traditional financial audits,⁴² but the GAASGA expand the audit parameters beyond traditional financial aspects to include compliance with applicable laws and regulations and also to determine the efficiency and economy of operations and the effectiveness of the programs being reviewed.

The GAO standards follow the same general organization as the generally accepted auditing standards of the AICPA, and the standards applicable to financial audits are intended to be identical. However, in GAO's definition, an audit may also be concerned with efficiency and economy of operations, compliance with both financial and non-financial laws and regulations, and with program effectiveness.⁴³

GAASGA developed by the GAO are being recognized internationally as a frame of reference to improve the quality of governmental auditing, serve as criteria to evaluate audit organizations, expand the auditing scope to ensure full accountability, help make better evaluations of government operations, provide reasonable assurance of compliance with laws and regulations, provide sufficient evidence to determine whether fraud, abuse, or illegal acts have occurred, stimulate self-improvement, save time by reducing duplicate auditing through improvement of original audit operations, and serve as a guide for governmental audit training and education.

Governmental auditing in Kuwait is being performed without a frame of reference to guide its organization. There are no generally accepted auditing standards to be observed in conducting audits of governmental operations and activities. Consequently, audit guidelines and comprehensive audit instructions tailored to particular programs or program areas do not exist. Audits performed by the Audit Bureau are restricted to compliance audits that entail the total examination of financial transactions, accounts, and reports, including an evaluation of the compliance with applicable

⁴¹ U.S. General Accounting Office, *Standards for Audit 1981*, ii.

⁴² American Institute of Certified Public Accountants, *Statement on Auditing Standards No. 1, Codification of Auditing Standards and Procedures* (New York: AICPA, 1973), Section 150.

⁴³ American Institute of Certified Public Accountants, *Auditing Standards Established by the GAO, Their Meaning and Significance for CPAs* (New York: AICPA, 1973), 10.

laws and regulations and to a determination of whether the governmental unit's spending was within the limit of the appropriation by the National Assembly.

Comprehensive Auditing

Comprehensive auditing is an expanded concept of governmental audit responsibility that has been advocated under a variety of different names. Alternative names are operational, performance, full accountability, and management auditing. Comprehensive auditing in government is full-scope auditing that includes the examination and evaluation of (1) financial aspects; (2) compliance with policy, plans, procedures, laws, and regulations; (3) the efficiency and economy with which governmental resources are used; and (4) the effectiveness with which program results are achieved.

Comprehensive auditing received a significant boost with the GAO's publication of the GAASGA in 1972. The expanded audit scope of the GAO's revised standards in 1981 emphasizes three levels of the audit as follows:

1. Financial and compliance — determines (a) whether the financial statements of an audited entity present fairly the financial position and the results of financial operations in accordance with generally accepted accounting principles and (b) whether the entity has complied with laws and regulations that may have a material effect upon the financial statements [financial and compliance audit].
2. Economy and efficiency — determines (a) whether the entity is managing and utilizing its resources (such as personnel, property, space) economically and efficiently, (b) the causes of inefficiencies or uneconomical practices, and (c) whether the entity has complied with laws and regulations concerning matters of economy and efficiency [operational audit].
3. Program results — determines (a) whether the desired results or benefits established by the legislature or other authorizing body are being achieved and (b) whether the agency has considered alternatives that might yield desired results at a lower cost [performance audit].⁴⁴

The comprehensive audit normally includes the three levels described, although it may be practical in particular circumstances for an audit to include only one or two of the levels. One factor determining the scope of the audit is that there must be a positive relationship between cost of the audit and the needs of expected users of the audit results.⁴⁵

The comprehensive audit scope defines three audit levels, which for convenience are referred to as I, II, and III. Level I audits,

⁴⁴ U.S. General Accounting Office, *Standards for Audit 1981*, 12.

⁴⁵ *Ibid.*, 13.

while similar to the basic financial audit, require testing to determine compliance with applicable laws and regulations and includes sufficient work to determine whether the financial statements of an audit entity are presented fairly in accordance with generally accepted accounting principles; level II audits call for a review of operational controls to determine whether the entity is managing or utilizing its resources in an economical and efficient manner and identify ways to improve operations, reduce costs and enhance revenues, including testing for compliance with applicable laws and regulations concerning matters of economy and efficiency; level III audits include inquiries into the results or benefits achieved and whether established objectives for programs and activities have been met.

All levels in a comprehensive audit interrelate. Level I audits (financial and compliance audits) require the evaluation of internal accounting controls while level II audits (operational audits) require the evaluation of operational controls (the term "operational control" is considered equivalent to "administrative control"); the difference centers conceptually on a matter of emphasis; in both levels I and II, the auditor must understand the unit's activities, systems, operations, and records.⁴⁶ Level II audits (operational audits) and level III audits (performance audits) involve similar justifications. To determine whether a program has achieved its goals, the auditor must review its detailed objectives and measurement criteria, many of which involve preferred practices (operational controls). The interrelations between the levels involved in a comprehensive audit are summarized in a model in Exhibit 2.

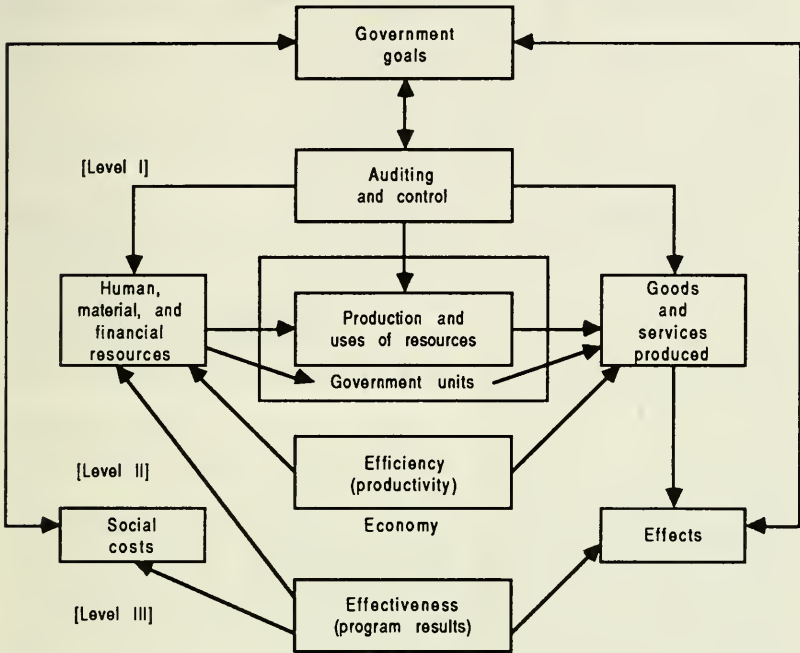
Governmental auditing in Kuwait is a financial and compliance audit (level I audits) concerned with the examination of financial transactions, accounts and reports, including an evaluation of compliance with applicable laws and regulations. No audits are performed to determine how effectively inputs are used to provide outputs or how well outputs provide the desired benefits and results. The present auditing of governmental transactions in Kuwait does not ensure full accountability and does not assist governmental officials and employees in performing their responsibilities.

SUMMARY AND RECOMMENDATIONS

Rapid economic development and rising government expenditures in Kuwait have created the need to monitor those expenditures to ensure optimum economic and social returns and to improve

⁴⁶ Pomeranz, "Public Sector Auditing," 51.

Exhibit 2. Levels of Governmental Auditing



The idea for this model is attributed to Naim H. Dahmash, "Public Auditing Developments in the Arab States: A Comparative Study," *International Journal of Accounting* (Fall 1982), 111.

the performance of government operations and activities. The achievement of this objective depends completely upon the effectiveness of the Audit Bureau in discharging its functions and responsibilities.

Governmental auditing in Kuwait currently focuses on legal and financial compliance through detailed voucher audits (level I audits). The audit scope is not expanded to include measurements of efficiency, economy, and effectiveness of public expenditures. The inadequacy of public transactions audits is due to both environmental and technical factors. Environmental factors include such variables as the nature of economic development evolution, administration practices, social structure, skewed distribution of wealth, interests of pressure groups, and sociological-cultural characteristics. Technical factors include limitations imposed by legal requirements, lack of skilled staff members, and absence of generally accepted auditing standards.

To improve the quality and achieve effective governmental auditing in Kuwait, the following recommendations are suggested:

1. The functions of the Audit Bureau should be expanded to entail the comprehensive audit concept;
2. The government financial management system must be improved, as a whole, to meet the needs for more information of the management of governmental entities;
3. The generally accepted auditing standards of the GAO should be recognized as a frame of reference to improve the quality of audits in Kuwait at all government levels;
4. Audit guides should be prepared by governmental entities to ensure the effectiveness of auditing their operations and activities;
5. Operational controls at all levels should be supported with guides of preferred practices;
6. Appropriate professional training programs for all technical staff members should be offered periodically to improve their skills and increase their competency;
7. A special salary scale, incentives system, and career tenure should be devised to attract skilled personnel;
8. University graduates in other specialities, such as computer sciences, engineering, medicine, and agriculture, should be appointed as technical staff members of the Audit Bureau to meet the diversified needs of governmental auditing;
9. Computer systems for governmental financial management processes should be considered to improve the quality and the quantity of information generated; and
10. A single audit concept should be evaluated as an approach to improve audit coverage. This approach changes the focus of audits from individual funds to the operating entity as a whole.⁴⁷

⁴⁷ Charles A. Bowsher, "The GAO and the Accounting Profession," *Journal of Accountancy* (February 1983), 70.

Accountability, the Threshold of Political Instability, Underdevelopment, and Misery: The Case of Africa

J. B. GHARTEY*

The year 1984 concluded rather somberly. A significant isolated event of that year managed to attract world attention to some of the grueling problems facing Africa and most parts of the Third World. The Ethiopian famine was a classic exhibit of mass misery and hunger, and the alarming disparities between the living conditions of the rich and poor in the world. In addition to the famine in Ethiopia, the United Nations Food and Agricultural Organization reported that tens of millions of people in over twenty other African countries were also starving, hungry, facing malnutrition, or other economic and social hardships.¹

What is even more disheartening concerning the Ethiopian example is that the factors that created the catastrophe belong to a systemic or institutionalized group of forces that have been aptly summarized by the Brandt Report, "Waste and corruption, oppression and violence, are unfortunately to be found in many parts of the world."²

Factors that generate economic malaise — inappropriate policies,

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¹ *U.S. News and World Report* (24 December 1984), 33.

² The Brandt Report was issued by the Independent Commission on International Development Issues that studied the serious global problems arising from the social and economic disparities in the world community and made recommendations to the United Nations and the world community. Willy Brandt, *North-South: A Program for Survival* (Cambridge, Mass.: MIT Press, 1980).

abuse of power, fraud, corruption, oppression and violence, inefficiency, embezzlement, incompetence, misappropriation of public funds, and economic and financial mismanagement — are present to some degree in all societies.³ The extreme poverty, dependence on foreign aid and assistance for national survival, and other socioeconomic constraints in the developing world, however, make the symptoms of economic malaise highly volatile to the political, social, and economic national environments, and the international community.

The international community has generally reacted favorably and generously to fellow humans in other parts of the world who become victims of intolerance, brutality, and other unfortunate circumstances. For example, food and drug aid were donated to Ethiopia and other parts of the developing world. The United Nations and The World Bank have made Africa their regional priority for the 1980s and have increased their disbursements to the continent by 50 percent to more than \$1.1 billion for 1985.⁴ Controversies have existed in both the United Kingdom and the United States (two of the major aid donors to Africa) as to the form and scale of increased aid to Africa.⁵ The *New York Times* reported in 1985 that a group of thirteen industrialized nations and the World Bank have pledged more than \$1 billion to establish a fund to provide long-term assistance to African nations suffering from famine and economic collapse.

These efforts to alleviate suffering in developing countries are highly humane and commendable. As noted by several prominent persons and organizations, however, sympathy and charity can generally offer only palliatives to such perennial and endemic problems as poverty and misery, economic underdevelopment, and political instability. Thus, both the international and the domestic African communities are more than ever demanding greater accountability and long-term measures to minimize the symptoms of economic malaise in Africa and other developing countries.⁶

³ For example, G. E. Caiden and Naomi J. Caiden, "Administrative Corruption," *Public Administration Review* (May-June 1977), 302-9; and D. J. Gould and J. A. Amaro-Reyes, *The Effects of Corruption of Administrative Performance: Illustrations for Developing Countries* (Washington, D.C.: The World Bank, 1983). In this paper, these symptoms of economic malaise will be referred to as "economic malaise."

⁴ The *New York Times* (10 January 1985), A23.

⁵ The *New York Times* (4 January 1985), A4 and (10 January 1985), A23.

⁶ President Ronald Reagan, quoted in The *New York Times* (4 January 1985), 4; The World Bank, *The World Development Report 1984* (Washington, D.C.: World Bank, 1984) and *The World Development Report 1983* (Washington, D.C.: World Bank, 1983); and the Brandt Report.

The Brandt Report, for example, recommends:

Change and reform cannot take place in a one-way street: they must be supported by governments and people in both industrialized and developing countries. If we are honest and want to promote international understanding we should not avoid any serious exchange of views. . . . [We] should frankly discuss abuses of power by elites, the outburst of fanaticism, the misery of millions of refugees, or other violations of human rights which harm the cause of justice and solidarity, at home and abroad.⁷

The Brandt Report, no doubt, places a formidable social responsibility on the world community. The recommendation poses a challenge to accountants' acceptance of social responsibility and advancement of social obligations as characteristics of their profession.⁸ Consistent with current world concern in Africa, this paper will

1. Provide a brief outline of the geographic, demographic, and ideological differences in the African setting. It will then indicate that, in spite of differences, reliance on the similarities of the socioeconomic setting in Africa can serve as a basis of discussion for problems of economic malaise in Africa and other parts of the developing world;
2. Review the main factors that have created, sustained, and/or exacerbated economic malaise in Africa;
3. Confirm how accountability has emerged as the threshold of political instability, underdevelopment, and misery in Africa; and
4. Make recommendations to the accounting profession on areas where the profession's assistance would be most welcome in formulating long-term strategies to ensure effective accountability and stewardship.

THE SETTING IN AFRICA AND THE THIRD WORLD

Africa is the second largest continent in the world. It is the continent with the widest national ranges of natural and physical resources. It encompasses Nigeria, a country of 85 million (approximately 20 percent of the continent's population in 1980) and a number of small countries, such as Gambia, Togo, and Swaziland, each with a population of less than 1 million.⁹

There are countries rich in oil and mineral resources, such as Gabon, Nigeria, Zaire, and Zambia, as well as countries with

⁷ Brandt Report, 7.

⁸ For example, American Institute of Certified Public Accountants, *Commission on Standards of Education and Experience for CPAs* (New York: AICPA, 1956), 1.

⁹ *World Bank Atlas* (Washington, D.C.: World Bank, 1983), 12-16.

minimal resources, such as Upper Volta,¹⁰ Niger, Mali, and Chad. Some countries border the ocean; others are landlocked. There are countries with tropical rainforests and others with semi-arid regions. Some countries have adopted the socialist ideology of socioeconomic transformation; others are attempting to follow the ideology of the industrial market economies.

In spite of these differences, an extraordinary degree of similarities exists throughout Africa and most parts of the Third World as to the nature of problems of policies, political and socioeconomic transformation, and management of resources.¹¹

All the independent African countries except Liberia, Ethiopia, and Egypt emerged from colonial rule after 1950. Of the forty-nine countries, forty achieved independence after 1960. All forty-nine countries share some common socioeconomic problems.

The economic problems common to African and most other Third World countries include scarcity of capital, low per capita income (\$250 per annum compared to over \$10,000 in the industrial market economies), low savings rates, inadequate financial institutions, high rate of population growth (2.7 percent), extreme dependence of the economy on export of primary products and import of consumption goods, inadequate communication processes, inadequate technology, high incidence of illiteracy, shortage of skilled manpower, high level of unemployment, managerial problems, and extreme ethnic diversity and political instability.¹²

This paper will focus on the similarities of the phenomena and events that have taken place in Africa in the past thirty years. Shils, however, notes:

It is obviously necessary to ascertain the unique features of societies and politics. These are already so apparent that their detection as such will not cause us any great difficulty. Indeed, the likelihood that their particularity will overwhelm us, is rather the greater danger. Our task in this regard is to find the categories within which the unique may be described, and in which its differences with respect to other situations may be presented in a way that raises scientifically significant problems.¹³

An understanding and appreciation of both the differences and similarities in the African setting are fundamental to the accountant who may be involved in formulating long-term feasible solutions to the plight of Africa and other parts of the Third World.

¹⁰ The name of Upper Volta was changed to Burkina Faso on August 4, 1984.

¹¹ World Bank, *Development Report 1983* and *Development Report 1984*.

¹² Ibid.

¹³ E. Shils, "On the Comparative Study of the New States," in *Old Societies and New States*, ed. C. Geertz (London: Free Press of Glencoe, 1963), 15.

AFRICA'S PROTRACTED NIGHTMARE

Between 1952 and 1984, fifty-one successful military coups were reported in Africa. The first was Egypt (July 23, 1952) and the most recent (at the time of this paper), Mauritania (December 13, 1984). Over 55 percent of the forty-nine independent African countries have had at least one successful coup. Benin (six), Ghana (five), Nigeria (four), and Burkina (four) in West Africa account for nineteen of the fifty-one coups, approximately 40 percent of the total number. Most of the countries that have not as yet had a successful coup have nevertheless had some political turbulence.¹⁴

Administrators, public officers, and persons in a position of trust are said to be responsible, sensitive, and accountable if they consciously seek to promote the congruence of their actions with the value preference of the community, people, and groups whom they serve.¹⁵ Of the fifty-one military coups reported, twenty-six cited economic malaise mainly attributable to corruption and mismanagement as the principal reasons for the coups. The other twenty-five assigned economic malaise generating from political and social strife as the main reasons for the coups.¹⁶

Benin, Ghana, Nigeria, and Upper Volta have each experienced almost the same combination of symptoms of economic malaise and inadequate accountability for each successive change of government. Those countries that have had a lesser number of coups (including those with no reported cases of successful coups) have also echoed inadequate accountability of public officers and symptoms of economic malaise.¹⁷ Even Zimbabwe, the country to gain independence most recently (1980), has also joined the chorus of inadequate accountability and economic malaise.¹⁸

Thus, African leaders have conceded that African politicians, soldiers, and others entrusted with public office have not been very successful in accounting effectively for their stewardship. The protracted incompetence and inadequate accountability and stewardship of public officers and politicians sustain and exacerbate economic malaise.

¹⁴ The New York Times, Index (1952-1984); *West Africa* (London: West Africa Publishing Co., 1980); C. E. Welch, ed., *Soldier and State in Africa* (Evanston, Ill.: Northwestern University, 1970), 29-31; and S. Decalo, *Coups and Army Rule in Africa: Studies in Military Style* (New Haven and London: Yale University Press, 1976), 10-11.

¹⁵ J. B. McKinney and J. C. Howard, *Public Administrations: Balancing Power and Accountability* (Oak Park, Ill.: Moore Publishing, 1979), 30.

¹⁶ The New York Times, Index (1952-84).

¹⁷ Ibid.; and *West Africa*.

¹⁸ *The Washington Post* (23 December 1984), A18.

Economic malaise fuels unemployment, austerity, inflation, scarcities of both imported and local goods, falling gross national product and standard of living, capital flight, corporate grievances, disillusionment in the political process, social antagonisms and violence, and political instability.¹⁹

The devastating effect of economic malaise may be even more disastrous in the future than the world has yet witnessed. Africa's economic and social conditions began to deteriorate in the 1970s and continue to do so. Gross domestic product (GDP) grew at an average of 3.5 percent between 1960 and 1973 but has fallen every year since; between 1973 and 1979, it was 2.1 percent. The figures for 1980, 1981, 1982, and 1983 were 1.3, 1.2, 0.5, and -0.1, respectively.²⁰

The decline in GDP, coupled with an estimated annual average population growth rate of 3 percent, validates a caution in the Brandt Report:

There is a real danger that in the year 2000 a large part of the world's population will still be in poverty. The world may become overpopulated and will certainly be overurbanized. Mass starvation and the dangers of destruction may be growing steadily — if a new major war has not already shaken the foundations of what we call world civilization.²¹

The Brandt prediction has been confirmed by African heads of state and other studies.²² Against this disquieting background, however, are words of inspiration and encouragement from these reports themselves and the eminent philosopher Reichenbach.

The 1981 World Bank Agenda for Accelerated Development for Africa, for example, indicates that if appropriate action is taken to reverse the stagnation and possible decline of per capita income projected in the 1980s, the calamity may be averted.²³ Reichenbach advises that "to confess ignorance in the face of the future is the tragic duty of all scientific philosophy."²⁴

¹⁹ Welch, *Soldier and State in Africa*, 29–31; A. Austin, "The Underlying Problem of the Army Coup d'Etat in Africa," *West Africa* (24 March 1972); and Decalo, *Coups and Army Rule*, 27–30.

²⁰ The Lagos Plan of Action is the statement of development strategy adopted by African heads of state at a meeting of the Organization of African Unity held in Nigeria in April 1980. Organization for African Unity, *The Lagos Plan of Action for the Implementation of the Monrovia Strategy for the Economic Development of Africa* (Lagos, Nigeria: OAU, 1980). Also, World Bank, *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (Washington, D.C.: 1983), 11.

²¹ Brand Report, 11.

²² World Bank, *Accelerated Development*, 11.

²³ *Ibid.*, 5.

²⁴ Hans Reichenbach, *Experience and Prediction: An Analysis of the Foundations and Structures of Knowledge* (Chicago: University of Chicago Press, 1938), 404.

Since it is possible to avert the catastrophe, accountants and the world community need not confess their tragic duty and wait for the doomsday. They must search for long-term solutions to the problems of suffering and misery in developing countries.

THE CHRONIC ECONOMIC MALAISE

The adverse effects of economic malaise in Africa have transcended national boundaries. Multinationals have suffered increases in operating expense budgets and losses from a variety of measures that impair viability and/or profitability of business operations of multinationals in Africa.²⁵ For the international community in general, economic malaise poses further strains on aid budgets and creates anxiety over the misery and survival of millions of fellow human beings.

Food, drugs, and technical aid are not the only strains on international budgets created by economic malaise in developing countries. For example, The United Nations High Commission for Refugees (UNHCR) was originally established thirty years ago by the United Nations General Assembly to resettle and integrate European refugees of World War II. It now attempts to serve more than 10 million refugees and displaced persons, most of whom are victims of political instability in Africa.²⁶ Between 1976 and 1981, the recipients of UNHCR aid for Africa accounted for 89 percent and 69 percent of U.S. and NATO military transfer to Africa, respectively. The figures for 1972 to 1976 are 46 percent and 58 percent.²⁷

The effects of the recent drought in Africa have helped to inform the world community of the severe problems of economic malaise in Africa. Drought-related problems have merely magnified the most extreme and distressing aspects of the more pervasive socioeconomic and political problems in Africa resulting in military coups attributed to the economic malaise.

Many African leaders and others have now conceded that many of the continent's pains are self-inflicted. They agree that the effects of the recent natural disasters and other calamities could have been averted if African leaders had served their nations more

²⁵ For example, D. Haendel, G. T. West, and R. G. Meadow, *Overseas Investment and Political Risk* (Philadelphia: Foreign Policy Research Institute, 1975); and L. Kraar, "The Multinationals Get Smarter about Political Risks," *Fortune* (4 March 1980), 86-92.

²⁶ S. Pitterman, "A Comparative Survey of Two Decades of International Assistance to Refugees in Africa," *Africa Today*, vol. 31, no. 1 (1984), 25.

²⁷ *Ibid.*, 34.

responsibly in the years before the disasters.²⁸ Instead, many of the leaders mismanaged economies, squandered national wealth, and literally threw away the continent's future as they jostled with one another for power.²⁹

On assumption of power, successive governments in Africa have made various pledges to investigate and purge the misdeeds of their predecessors and to introduce a more responsible system of government with accountability.³⁰ The purge resulting from these investigations has usually been illusory and limited. The measures have normally been taken after the harm has already been done, and they have been used as a witch hunt device to discredit and/or punish specific groups or individuals in the society. Invariably, the military or politicians consciously avoid victimizing their allies and associates in the purging exercise.³¹

A variety of written constitutions (e.g., in Ghana in 1970 and 1979 and Nigeria in 1979), based mainly on models from industrialized countries, has been tried to ensure accountability and stability in the government. However, these constitutions have been misused by political parties unable to resist the temptation to use political power to generate funds to ensure their survival and for individual party members to enrich themselves.³²

Military regimes that have supplanted civilian governments have generally achieved little success in resisting the temptations of economic malaise that led to the demise of their civilian counterparts. As Decalo notes: "There has been no evidence beyond rhetoric and pious declaration of any sincere desire by most military regimes in tropical Africa to bring about fundamental social change or a rearray of power within African states."³³

Thus, the numerous coups, counter coups, and attempted coups have merely aggravated the problem of economic malaise in Africa.

DIAGNOSING THE CHRONIC ECONOMIC MALAISE

Past efforts to alleviate economic malaise have had limited success because generally, except for imposing rulers on the population, undue emphasis was placed on ideological and vindictive issues.

²⁸ The World Bank, *Development Report 1984*, 1-2.

²⁹ *Newsweek* (26 November 1984), 55.

³⁰ Decalo, *Coups and Army Rule*, 26-35; W. Gutteridge, *Military Institutions and Power in New States* (London and Dunmow: Pall Mall Press, 1968), 80-88; *The New York Times*, Index; and *West Africa*.

³¹ Decalo, *Coups and Army Rule*, 28.

³² *West Africa* (1979, 1982, 1983, 1984).

³³ Decalo, *Coups and Army Rule*, 27.

The first military coup in Africa was in 1952 when General M. Naguib ousted King Farouk from office in Egypt. General Naguib cited bribery, corruption, and delays in instituting socioeconomic reforms as the main reasons for his coup. A corruption purge decree (retroactive to 1939) was enacted and a seven-man court was established to try cases under an accelerated program. Various forms of punishment including imprisonment, loss of citizenship, and barring from political activity and public office were provided under the decree.³⁴

This precedent set by General Naguib has been adopted with slight modifications by most military rulers in Africa from 1952 to the present. There are still military tribunals trying various cases of economic malaise in Ghana (from 1979 and 1982), Liberia (from 1980), Nigeria (from 1984), and Upper Volta (from 1984). The sentences, such as those in West Africa from 1979 to 1985, have ranged from confiscation of assets and/or unrealistic eternities of prison sentences to capital punishment.

Behaviorists have proved that punishment is not as effective in modifying behavior as reinforcement.³⁵ The behaviorist's view is echoed by Caiden and Caiden, who assert that the emphasis of socioeconomic reform should not be on individual misconduct in public office, "serious though it is, but [on] the institutional subversion of public interest through systematic corruption, misconduct and mismanagement."³⁶

Emphasis on simply changing politicians to achieve efficiency and accountability in the political system has been found to achieve marginal success since 1880.³⁷ As Allen notes:

Inefficiency of government is primarily due to the badness of methods of men. Efforts to correct misgovernment have too frequently failed, or have had only passing success, because men, not methods, were attacked.³⁸

Allen's view has been reinforced by the subsequent research of contemporary scholars. Simon, Smithburg, and Thompson, for example, state: "Efficiency is the greatest merit in administration. Behavior that deliberately wastes resources or makes less use of

³⁴ The New York Times, Index (1952).

³⁵ Amitai Etzioni, *A Comparative Analysis of Complex Organizations* (New York: The Free Press, 1975), 3.

³⁶ Caiden and Caiden, "Administrative Corruption."

³⁷ McKinney and Howard, *Public Administrations*, 339.

³⁸ William H. Allen, "Proceedings of the Pittsburgh Conference for Good City Government and the Fourteenth Annual Meeting of the National Municipal League (1908), cited in McKinney and Howard, *Public Administrations*, 339.

them than would be otherwise possible is generally thought irrational, if not immoral."³⁹

Public and international concern of the efficacy of policies, management, and programs of African governments has increased since the catastrophic effects of previous economic malaise have aggravated the misery of the African population and have brought greater pressure on the international community for more aid and technical assistance.

The United Nations and other donor countries and organizations that provide aid and other technical assistance to Africa have normally imposed various accountability requirements on the recipient countries.⁴⁰ Most of the donor countries and aid donors, including the World Bank, agree, however, that past aid programs in Africa have failed because of misguided government policies that wasted resources and discouraged farming and other productive endeavors.⁴¹ Thus, collectively and individually, major donors now impose more stringent accountability and surveillance measures than ever before on aid and funds disbursed to Africa. The United States withdrew its entire contribution from UNESCO (25 percent of the total UNESCO budget) on December 31, 1984. The withdrawal was an expression of protest and lack of confidence in the administration of UNESCO's aid and technical assistance programs. Great Britain, Singapore, and other Western countries have also given notice of their intention to withdraw their contributions from UNESCO.⁴²

Representatives of the World Bank and twenty-three potential donor countries attended a two-day meeting in Paris on January 31 and February 1, 1985, to raise funds for Africa. At the meeting, they agreed in principle that the World Bank would manage funds raised and would allocate them only to African countries that adopt economic policies that encourage private business, assist farming, and generally eliminate bureaucracy and waste. A group of thirteen industrialized countries pledged more than \$1 billion to establish a new fund to provide long-term economic assistance to African countries suffering from famine and economic collapse.⁴³

No doubt, both the African population and the international

³⁹ H. A. Simon, D. W. Smithburg, and V. A. Thompson, *Public Administration* (New York: Alfred Knopf, 1962), 71.

⁴⁰ *The Role of Accounting in Economic Growth and Development* (Washington: Society for International Development, 1977).

⁴¹ The New York Times (4 January 1985), A4.

⁴² Ibid., A3.

⁴³ The New York Times (2 February 1985), A1.

community have been searching for long-term solutions to the problems of inadequate accountability and economic malaise in Africa. It is evident, however, that achievement of efficiency and accountability does not lie in elaborately written constitutions, substitution of one group of politicians for another set or for soldiers, or indefinite reliance on foreign aid and technical assistance. Emphasis should be on designing systems, methods, and procedures to improve government policy, planning, operations, and accountability through reorganization and the establishment of appropriate, efficient economic measures.⁴⁴

Design of such systems, methods, and procedures is the area in which accountants have the greatest responsibility, potential, and expertise to contribute long-term solutions to the problem of economic malaise and to develop effective accountability and stewardship. Gerborth states:

Accounting research has a role to play in the political process. Researchers must contemplate the results of actions in the political arena, and cannot be confined to questions of technology and absolute truth.⁴⁵

The accounting profession has the necessary knowledge, skill, and talent to influence the production and dissemination of reliable and meaningful data for all sectors of the economy.

ENVIRONMENTAL IMPEDIMENTS TO ACCOUNTABILITY

The call for accountability by politicians and public officers in Africa has the blessing of the African population (both soldiers and civilians) and the international community. Accountability is an almost unassailable concept, but as Cohen cautions: "The need is clear but the danger exists that rhetoric will rule over reason and passion will prevail over logic."⁴⁶

The most common pledge made by military rulers after their coup is to introduce a more responsible system of government with accountability and to investigate and purge the misdeeds of the previous regimes, yet even countries with well-developed and organized accounting systems and standards have difficulty with the definition and application of accountability. Bedford, for example, notes: "Objectives, concepts, means and methods for achiev-

⁴⁴ McKinney and Howard, *Public Administrations*, 339; and P. Bauer and B. Yamey, "Foreign Aid Isn't," *Across the Board* (March 1982), 29-36.

⁴⁵ D. L. Gerborth, "Research, Intuition and Politics in Accounting Inquiry," *Accounting Review* (July 1973), 479.

⁴⁶ Albert H. Cohen, in *Accountancy in the 1980s — Some Issues*, Proceedings of the Arthur Young Professors Roundtable 1976, ed. Norton M. Bedford (Reston, Va.: Reston International Center, 1977), 67.

ing accountability have not been developed, and no generally accepted guidelines are available. Even the literature is not well articulated."⁴⁷

In addition to the conceptual problems of accountability, African countries have other environmental problems that thwart accountability efforts. Among them are deficiencies in the accounting systems, government monopoly of power and economic resources, bureaucratic secrecy, conflicts in perspective and institutional linkages, inadequate surveillance systems, poverty and lack of motivation, cultural factors, and crisis management.

Deficiencies in the Accounting Systems

The deficiencies in the accounting systems in Africa include inadequate, unreliable, and untimely information systems; ineffective systems of internal controls and internal checks; a dearth of qualified accountants and dedicated management personnel; poor and inefficient management; and professional incompetence. Thus financial statements and reports that are expected to be the main indicators of economic and financial conditions of entities fail to disclose material information. This provides inadequate safeguards against fraud, corruption, and other malpractices.⁴⁸

Government Monopoly

Power and decision making are extremely centralized in most African countries. "Public sector responsibilities have become unmanageably large."⁴⁹ This expansion in the public sector has generally been accompanied by a proliferation of confusing networks of regulations and bureaucracy. These networks delay action and prompt individuals and powerful business groups to compete through corrupt means for access to goods, employment, and services in such areas as licensing, import and export permits, bank loans, government contracts, and other favors.⁵⁰

Bureaucratic Secrecy

The government controls the economy, the press, and the news media. A high degree of cronyism is frequently practiced with public appointments. This increases the probability of entrusting

⁴⁷ Ibid., p. 174.

⁴⁸ Adolf J. H. Enthoven, "An Evaluation of the Accountancy Systems, Developments and Requirements in Africa — Appraisal Report" (Ford Foundation Study Project, 1975); and Elmer B. Staats, *Training and Related Efforts Needed to Improve Financial Management in the Third World* (Washington, D.C.: General Accounting Office, 1979), 1.

⁴⁹ World Bank, *Toward Sustained Development in Sub-Saharan Africa: A Joint Program of Action* (Washington, D.C.: World Bank, 1984), 37.

⁵⁰ G. Leys, "What Is the Problem about Corruption?" *Journal of Modern African Studies*, vol. 3., no. 2 (1965).

people of questionable records with responsible public positions. In addition, there is limited freedom of expression and discussion of public issues. Such secrecy grants the government and public officers opportunities that are highly repugnant to effective accountability. The government and public officers are able to cover up mistakes, conceal misbehavior, make policies without consultation, undermine the rationality of government decisions, and allow politicians (and the military) to escape accountability for their actions until they are overthrown from power.⁵¹

Conflicts in Perspective and Inadequate Institutional Linkages

As a result of the high level of bureaucratic secrecy and autocracy in the African public sector, review and evaluation of public programs are frequently difficult. In many cases, it is difficult to determine who is accountable for various aspects of the programs and the results the program was intended to achieve. The information links between what was intended and what was accomplished are normally not provided. Added to the problem of inadequate institutional linkage is that of constrained professional independence. To be effective, an evaluator must perform with due professional skill and independence. However, issuance of an independent opinion or report may be construed as an affront to authority. This may lead to tension, pressure, loss of job, or other unpleasant consequences.⁵²

Technological Obsolescence and Inadequate Surveillance Systems

Effective surveillance systems for accountability require the availability of technical personnel, expenditure of resources, and development of criteria for assessment. The required human and physical resources are frequently neither available nor adequate.⁵³

Poverty and Lack of Motivation

Poverty, austerity, scarcities, and job insecurity encourage people not only to tolerate corruption but also to initiate it. In several African countries, the salary structure for public servants is such that the entire take-home pay is inadequate to afford a balanced diet, let alone other items (e.g., clothing, transportation, etc.) in the normal family budget. To make matters worse, there are frequent shortages of essential consumer goods and incidents of

⁵¹ F. Rourke, "Administrative Secrecy: A Comparative Perspective," *Public Administration Review* (January-February 1975), 1-2.

⁵² E. L. Normanton, *The Accountability and Audit of Governments* (New York: Praeger, 1966); and J. R. Hamilton, "Approaches to Government Auditing around the World," *GAO Review* (Winter 1980), 14-17.

⁵³ *The Role of Accounting in Economic Growth and Development*, 44-45.

arbitrary dismissal and forced retirement from public office. Public officers may illegally spend a substantial amount of office time on other activities to earn money, to search for consumer goods, or to indulge in other malpractice.⁵⁴

Cultural Factors

In Africa, the clan (extended family) frequently takes precedence over the welfare of the individual. Thus, the extended family system places responsibilities on individuals that may far exceed the individual's earnings. This creates temptations for corruption and other malpractice.

Crisis Management

Political instability in the African environment creates a vicious cycle of fear, tension, insecurity, and uncertainty. African citizens and residents fear imminent personal and physical harm arising from such social disorders as personal assault, loss of job, and damage to property in the event of a political upheaval. Business proprietors realize that their profits are illusory and temporary and that the real worth of their enterprise will not sustain them for long because of the unstable socioeconomic environment. Multinationals can do little long-term planning because of the imminent risks of political instability that might impair their business viability and profits. Public officers and bureaucrats do not have reasonable tenure of office. They may be dismissed or forced to retire from office at any time. The government itself nurses the fear that if the economy does not thrive, the country could be prone to internal turbulence that could lead to attempted coups and counter coups. Thus, the government devotes more time and effort to security measures to prevent probable opposition at the expense of more important matters such as determining rational national goals, priorities, and strategies.⁵⁵

Summary, Conclusion, and Recommendations

The factors outlined in this paper which constitute the symptoms of economic malaise — inappropriate policies, abuse of power, fraud, corruption, incompetence, inefficiency, embezzlement, mis-

⁵⁴ J. H. Mensah, Chairman, *Report of the Commission on Review of Salaries and Pensions in the Public Services of Ghana* (Accra, Ghana), 63; H. H. Werlin, "The Roots of Corruption — The Ghanaian Enquiry," *Journal of Modern African Studies*, vol. 10, no. 2 (1972), 247–66; Gould and Amaro-Reyes, *Effects of Corruption*; and V. Eker, "On the Origins of Corruption: Irregular Incentives in Nigeria," *Journal of Modern African Studies*, vol. 19, no. 1 (1981), 173–82.

⁵⁵ G. Myrdal, *The Challenge of World Poverty* (Harmondsworth, England: Penguin Books, 1970); M. Faber and D. Seers, *The Crisis in Planning*, vols. 1 and 2 (London: Chatto and Windus, 1972); Kraar, "Multinationals Get Smarter"; and *West Africa* (1982 to 1984).

appropriation of public funds, and economic and financial mismanagement — are present to some degree in all societies. The extreme degree of poverty, dependence on foreign aid and assistance for national survival, and other constraints in Africa and other parts of the developing world, however, make the domestic African environment extremely volatile and susceptible to turmoil.

The year 1984 epitomized the culminative effects of economic malaise in Africa. In the past, the source of misery and underdevelopment in Africa was mainly attributed to colonialism. It was argued that colonialism destroyed the fundamental rhythm of precapitalist African life without fully advancing a new self-sustained process of accumulation. However, this line of argument has lost momentum.⁵⁶ Now both the international community and African leaders agree that Africa's present predicament is mainly due to the fact that African economies have generally been grossly mismanaged within the past twenty-five years. Successive African governments and the international community have identified inadequate stewardship and accountability as the key to sustained misery, poverty, and underdevelopment in Africa.

Past and current efforts to ensure effective stewardship and accountability of politicians and public officers have included violent changes of governments, establishment of committees of inquiries (or military tribunals) to probe misdeeds of public officers and others, and frequent declarations and pledges of soldiers and politicians to institute accountability to alleviate misery and poverty. However, these efforts have achieved minimal success mainly because they have focused on attempting to rectify the past mistakes and malpractices of individuals instead of concentrating on combating systemic and/or institutional factors in the environment that create, sustain, and/or exacerbate economic malaise. These environmental factors that exacerbate inadequate accountability and stewardship and hence misery and underdevelopment include deficiencies in accounting systems, conceptual and operational difficulties of accountability, government monopoly of power, bureaucratic secrecy, conflicts in perspectives and inadequate institutional linkages, technological obsolescence and inadequate surveillance systems, poverty and lack of motivation, cultural factors, and crisis management.

Crisis management techniques and the rather autocratic nature of most African governments make the already deficient account-

⁵⁶ Bill Freund, *The Making of Contemporary Africa: The Development of Africa Since 1800* (Bloomington, Ind.: Indiana University Press, 1984), 234.

ability systems more defective. Crisis management encourages ad hoc planning and an uncongenial atmosphere for appropriate policy formulation, implementation, review, and evaluation.

Crisis management and autocratic regimes create an atmosphere of uncertainty, resentment, frustration, inefficiency, distrust, fear, and repression. Fear and repression intimidate and terrorize honest public officers and evaluators (auditors) into silence. This encourages and conceals inappropriate behavior and policies. Thus, a vicious cycle of economic malaise, underdevelopment, poverty, misery, and political instability is sustained in the environment.

The accounting profession can contribute long-term solutions to ensure effective stewardship and accountability in Africa and other Third World environments by assisting with efforts to:

1. Improve and simplify administrative procedures to strengthen management information systems;
2. Educate African governments and the public to the benefits, purpose, and means to achieve adequate stewardship and accountability; and
3. Educate and train the required personnel to perform and/or assist with the accountability and stewardship functions.

The African continent and other parts of the developing world have been searching for strategies for effective accountability and stewardship. The search has been painful and more destructive than constructive, yet a solution must be found. As Burton notes:

Whether changes are more or less gradual, it is important that there be people within the system who are giving political as well as technical leadership. . . . Where the profession has exercised leadership, its initiatives have been generally accepted.⁵⁷

Effective accountability and stewardship are within the domain of the accounting profession. Thus, technical leadership for the hitherto fruitless and endless search for accountability should now find its rightful place with the accounting profession.

⁵⁷ *Accountancy in the 1980s*, 205-6.

Global Productivity Surplus Accounts

ALAIN BURLAUD and LIONEL DAHAN*

The surplus account method is the result of research conducted in two major fields, productivity assessment and the new patterns in the distribution of income. The former research mainly applied to measuring the productivity of labor and sometimes of capital. It was conducted in both the United States and in France in the early sixties, leading to the emergence of the concept of global productivity factors. The most significant American contributions came from Hendrick,¹ who primarily focused on macroeconomics, and Denison. In France, research on the subject was conducted by the Institut National de la Statistique et des Etudes Economiques (INSEE). André Vincent published in *Etudes et Conjoncture* numerous articles dealing with the French economy as a whole and with some specific sectors before writing his major work, *Measuring Productivity*.²

At the same time, other scholars were studying the new patterns in the distribution of income. On a less theoretical plane than the book written by Marchal and Lecaillon,³ research developed on income policies, either through the works published by economists or through more politically oriented contributions such as the "Conférence des Revenus" (October 1963 to January 1964) presided over by Pierre Massé, high commissioner of the "national

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¹ J. W. Hendrick, *Productivity Trends in the United States* (N.J.: Princeton University Press, 1961).

² André L. A. Vincent, *La mesure de la productivité* (Paris: Dunod, 1968).

³ J. Marchal and A. Lecaillon, *La répartition du revenu national* (Paris: Cujas, 1968).

plan." The report drafted after the conference stressed the connection between productivity gains and income distribution, as did works by authors such as Fourastié and de Jouvenel.

A clear convergence between the two approaches began to emerge in 1965. Research begun by Boiteux at Electricité de France (EDF) was completed by Puiseux and Bernard in collaboration with Vincent from INSEE.⁴ Focusing on productivity, that research also addressed the problem of how gains should be shared. When he was appointed president of EDF, Massé gave new impetus to this type of investigation. Bernard's publications on concrete implementations at EDF are important, as is his thesis "Productivity, Product Prices and Remuneration of Factors," as well as his book *The Dividends of Progress*, a self-explanatory title.⁵

The merging of the two approaches actually dates from the first research by "Centre d'Etude des Revenus et des Coûts" (CERC). The mitigated success of the "Conférence des Revenus," as well as the controversy on the issue during discussion of the Fifth Plan, led the French government to create in 1966 an organization whose goal, both limited and ambitious, was "to collect the necessary information for two purposes: a) implementing an incomes policy; b) assessing costs so as to determine the position of the French economy in relation to neighboring countries."

One of the major tasks of CERC, under the leadership of Jacques Peraud, was to "analyze the factors of productivity growth in business firms together with distribution patterns of productivity gains among customers, labor and capital. . . ." Capitalizing on such research, CERC's efforts included trying to make it operational. In December 1966, its surplus accounts method was presented at a convention which featured constructive discussions on the meaning of global productivity surplus accounts. The first issue of *Documents du CERC* (January-March 1969) outlines the method and deals with the main problems posed by its implementation and interpretation.

At the government's request, CERC tested the method in four public organizations.⁶ It also provided technical support to subsequent applications in a number of public and private organizations. In line with previous research on national accounting in constant

⁴ *Etudes et Conjoncture* (January 1965).

⁵ P. Massé and P. Bernard: *Les dividendes du progrès* (Paris: Seuil, 1969).

⁶ Documents du CERC (Paris: la Documentation Française), no. 3-4 (SNCF); 8 (Gaz de France); 11 (Charbonnages de France); 13 (Electricité de France).

francs,⁷ INSEE applied the method to the whole of the French economy divided for that purpose into seven major sectors.⁸ These applications helped publicize the method through press articles and its introduction in university syllabi.

In 1973, CERC reviewed the work completed and organized a seminar for specialists in May. In September, more than four hundred people, many of them top managers, attended a conference on the subject. *Documents du CERC*⁹ described the basic method and its application, as well as the problems the application posed. It also highlighted the relations between the productivity surplus and the financial equilibrium of business firms while suggesting the idea of an *extended surplus account*.

Since 1973, the method has generated theoretical research and has attracted the attention of business managers. To inform that public, in 1977, a joint CERC-Institut de l'Entreprise study group published a report presenting the major aspects of the method.¹⁰ In addition, CERC released a new, updated document.¹¹

THE PRINCIPLES OF THE SURPLUS ACCOUNT METHOD¹²

The concept of surplus is much more extensive than that of profit. Thus, if as a result of a more efficient organization, a workshop attains a higher production volume with the same quantity of production factors (labor, subcontracting, services, raw materials, equipment, etc.), a surplus exists. However, such a surplus may be absorbed by an increase in the wages and salaries paid to the firm's employees, in which case its profits will not increase. It may also be absorbed by its owners, the whole surplus going into increased profits. In reality, this surplus obviously has several origins: increases in production and cost cutting on a number of factors. This example, although very simple, indicates why this surplus reveals a discrepancy in relation to the previous situation and is thus valid only in "relative" terms while profits are "absolute" and why it may be looked at in terms of *production* or of *distribution*.

⁷ R. Courbis, "Comptes Nationaux à Prix Constants" in *Etudes et Conjoncture* (July 1964).

⁸ Ph. Templé, "La Méthode des Surplus, un essai d'application aux comptes des entreprises, 1959-1967 in *Economie et Statistiques* (December 1971).

⁹ Documents du CERC, no. 18 (2nd trimestre 1973): *Les Comptes de Surplus des Entreprises, méthodologie et modalités d'application*, 80pp.

¹⁰ Institut de l'Entreprise, *La méthode des comptes de surplus appliquée aux entreprises* (Paris, 1977).

¹¹ Documents du CERC, no. 55 and no. 56.

¹² Alain Burlaud, *Comptabilité et inflation*, éd Cujas, 202-204.

The Surplus as Seen from the Production Angle

"The idea leading to the definition of the 'extended surplus' is that management has improved if and when the volume of production exceeds the volume of Factors used in the process."¹³ The only difficulty is that these physical quantities, which are by definition heterogeneous (weight, volume, work hours, KS/hour, BTUs, etc.), are not comparable. Moreover, they very often do not appear as such in corporate accounts.

The problem may be solved in the following manners. (1) Variations in volume will be translated in terms of money. Thus, they will no longer be expressed in savings of, say, 120 working hours but of French franc (FF)3,000 in wages. (2) The global amount of what is paid for the various factors appears in the income statements as the product of a quantity multiplied by a unit cost. Because the unit cost is known, in many cases it is possible to find the corresponding quantity.

Let us suppose that in 1982, FF8,000 worth of raw materials was used at the average unit cost of FF8 and in 1983, FF9,000 were used at the average unit cost of FF10. Consumption in 1983 did not increase in volume over that of 1982. Indeed, the 1982 consumption amounted to $8,000/8 = 1,000$ Kg and that of 1983 to $9,000/10 = 900$ Kg. Thus, the productivity gain amounts to $100 \text{ Kg} \times \text{FF}8 = \text{FF}800$ (the originators of the method recommended assessing gains in volume at Year One prices). If a company eventually pays more for a smaller quantity of raw materials, it means simply that this gain has been (more than) taken by its supplier. This will be discussed in more detail later.

Briefly, if

S = extended surplus for Year 2

p_i = selling price of the company's i products

P_i = volume of i products

f_j = cost of factors of j production

F_j = consumption (in volume) of factors of j production, the extended surplus may be defined by the following equation:

$$S = \sum p_i \cdot \Delta P_i - \sum f_j \cdot \sum F_j$$

Let us see now how the benefits accruing from the extended surplus may be divided among all parties involved.

Distribution of the Extended Surplus

Two types of parties are involved, the customers of the firm and the suppliers of its "factors of production" (employees, suppliers of products and services, and providers of capital). The customers

¹³ CERC, No. 55-56 (1980), 10.

will attempt to purchase their products and services at the lowest possible price and will therefore attempt to share in any productivity gain achieved by the company. If they purchase quantity $\Sigma (P_i + \Delta P_i)$ during Year 2, a drop in the unit price will result in the following benefit:

$$\Sigma (P_i + \Delta P_i) \cdot (-\Delta p_i)$$

The suppliers of factors of production will attempt to charge as high a price as possible for their supplies. The benefit derived may be stated as follows:

$$\Sigma (F_j + \Delta F_j) \cdot \Delta f_j$$

The sum of accruing benefits (or disadvantages) by the various parties involved from Year 1 to Year 2 thus equals:

$$A = \Sigma (P_i + \Delta P_i) \cdot (-\Delta p_i) + \Sigma (F_j + \Delta F_j) \cdot \Delta f_j$$

which gives us the division of the surplus. It is then easy to show that $S = A$.¹⁴

THE SURPLUS ACCOUNT METHOD IN PRACTICE¹⁵

As presented, the productivity surplus is a variation. The method thus relies on the comparison of two income statements, corresponding to the Years n and $(n + 1)$ in our example. Moreover, as we attempt to assess productivity, each line of the income statement is separated into a quantity and a unit price. The measurement units of the quantities may be the following:

t = tons of materials:

h = hours of labor;

u = units sold for the sales P_1 or P_2 as well as for taxes;

F = francs for financial charges (total of loans), for depreciations (gross value of fixed assets), and for the net income (total of stockholders' equity).

The choice of such units may of course prove questionable in some cases. Financial charges, for example, are proportional to loans, but they also include the cash discounts granted to customers. Likewise, all taxes entered in the books as operating expenses (which do not include corporate tax) are far from being proportional to the quantities sold.

¹⁴ Ibid.

¹⁵ This example is borrowed from Geneviève Causse, "La Techniques des Comptes de surplus dans une situation de stabilité monétaire" (1980).

These income statements are presented in Exhibit 1. Any variation between Year N and Year N + 1 for all of the income statement items must be separated into volume and price, as was done with variations in direct costs. Payroll, for example, may be analyzed as presented in Exhibit 2.

In Exhibit 2, the FF680,000 are interpreted as a benefit shared among the firm's employees (in the form of wage increases)¹⁶ and a loss in productivity amounting to FF500,000 as a result of longer working hours, unless such loss is offset by a proportionate increase in the volume produced. The various differentials in volumes and prices are then listed in two tables in Exhibit 3 describing (1) the formation of the global productivity surplus (it may well be negative), which illustrates an effective corporate control over environmental constraints (i.e., optimal combination of production factors in relation to Year N price structure); and (2) the distribution of this surplus, which illustrates an effective corporate control over human factors (striving to achieve the lowest possible cost of production factors and the highest possible selling price of the production).

In this example, the positive global surplus amounting to FF842,000 is then distributed among the various parties involved in the organization. It may sometimes be supplemented by a "contribution" from parties who have suffered in the process. Thus, its suppliers contribute FF645,000 to the organization by allowing lower prices for raw materials. The customers of P2 also contribute a surplus which is not productivity based (since it has no relation with the combination of productivity factors) since they bear the increase in the selling price of this article. These operations may be summed up in Exhibit 4.

The diagram in Exhibit 4 shows clearly that the indicators of the production factors consumed — in addition to the information supplied by accounting books — make it possible to understand two concepts which are essential when dealing with the economic analysis of an organization: productivity and the distribution of wealth.

THE DIFFICULTIES OF APPLYING THE SURPLUS ACCOUNT METHOD

The Difference between Volume and Price

It is not always possible to resort to volume indicators for all items of the income statement. The method is not applicable in such cases. Construction and public works companies do not always

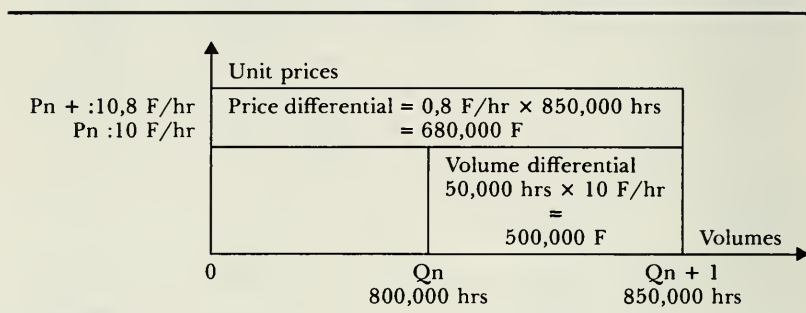
¹⁶ Inflation is not considered in this example.

Exhibit 1. Income Statements

| Income Statement for Year N | | | | | |
|---------------------------------|--------------|------------------|--------------|------------------------|------------|
| | Quantity | Unit price in FF | Total in MFF | Quantity | Unit price |
| Consumption of materials | 40 000 t | 125 F | 5 000 | Sales P1 ¹⁷ | 12 |
| Payroll | 800 000 h | 10 F | 8 000 | Sales P2 | 8 |
| Taxes | 1 900 000 u | 0,6 | 1 140 | | |
| Financial charges | 20 000 000 F | 0,1 | 2 000 | | |
| Depreciation | 16 250 000 F | 0,16 | 2 600 | | |
| Net income | 15 750 000 F | 0,08 | 1 260 | | |
| | | | 20 000 | | 20 000 |
| Income Statement for Year N + 1 | | | | | |
| | Quantity | Unit price in FF | Total in MFF | Quantity | Unit price |
| Consumption of materials | 43 000 t | 110 | 4 730 | Sales P1 ¹⁷ | 11,8 |
| Payroll | 850 000 h | 10,8 | 9 180 | Sales P2 | 8,1 |
| Taxes | 2 090 000 u | 0,7 | 1 463 | | |
| Financial charges | 21 250 000 F | 0,104 | 2 210 | | |
| Depreciation | 16 250 000 F | 0,16 | 2 600 | | |
| Net income | 16 300 000 F | 0,1 | 1 630 | | |
| | | | 21 813 | | 21 813 |

¹⁷ It is assumed here that the whole production has been sold.

Exhibit 2.



have their own construction and earth-moving equipment (e.g., cranes, excavators) and therefore frequently rent such tools. The costs thus incurred represent heavy expenses which should be considered. The range of the tools needed is so wide that it proves impossible to add, for example, hours of crane use to hours of compressor use. The cost of renting equipment expressed by a global number of hours cannot be a relevant volume indicator. The volume will thus be evaluated by resorting to an abstract unit (the hourly cost of renting an "average" tool) whose value will be based on the following equation:

$$Q \times UP = V$$

The income statement will give the values V_1 and V_2 for Years 1 and 2. The prices charged by the equipment rental company will give the unit prices (UP) for these two years. Taking into account the nature of the material rented, the firm concerned must bear a given rise in costs which may be calculated. The following figures are thus obtained:

| | |
|----------------------------|--|
| $V_1 = \text{FF}2,500,000$ | $V_2 = \text{FF}3,190,000$ |
| and | |
| $UP_1 = \text{FF}500$ | $UP_2 = \text{FF}580$ (a 16 percent increase in costs) |
| hence $Q_1 = 5,000$ | $Q_2 = 5,500$ (a 10 percent increase in volume) |

Quality Correlation

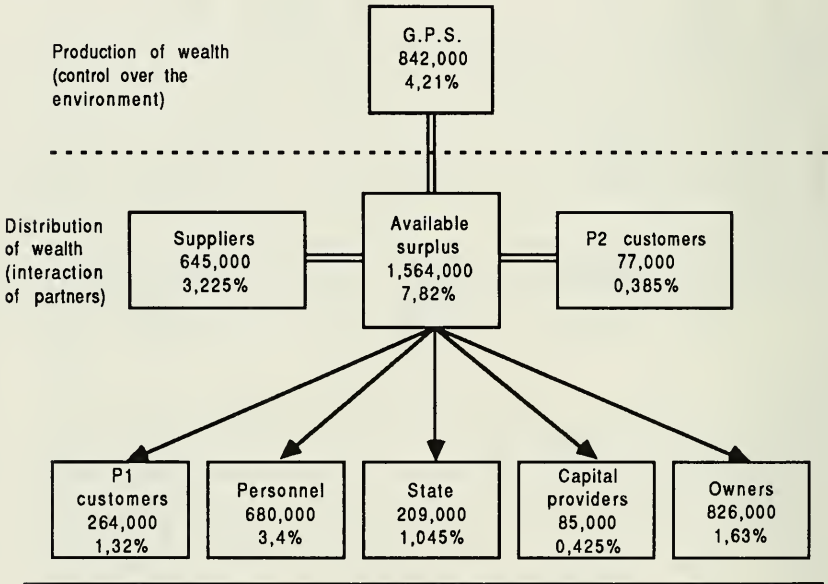
The volume differentials (both in factors or products) may become totally irrelevant if they concern products which are different in both terms of design and performance. Variations in prices, costs, and productivity may have no meaning when comparing operations on the Paris-Lyon railway line, the terms of reference being a

Exhibit 3. Calculating the Global Productivity Surplus (GPS)

| Differential income statement (N + 1) – N expressing volume differentials | | | | | | | |
|---|--------------------------|----------------|----------------|------------------------------------|----------------|-----------|------------------|
| Variation of the volume of production factors | | | | Variation of the production volume | | | |
| | Q differential | Unit price (N) | Total | Q differential | Unit price (N) | Total | |
| Consumption of materials | + 3 000 t | 125 F | 375 000 | Sales P1 | + 120 000 u | 12 F | 1 440 000 |
| Payroll | + 50 000 h | 10 F | 500 000 | Sales P2 | + 70 000 u | 8 F | 560 000 |
| Taxes | + 190 000 u | 0,6 | 114 000 | | | | |
| Financial charges | + 1 250 000 | 0,1 | 125 000 | | | | |
| Depreciation | — | | | | | | |
| Net income | + 550 000 | 0,08 | 44 000 | | | | |
| | | | <u>842 000</u> | | | | |
| GPS | | | 2 000 000 | | | | 2 000 000 |
| Differential income statement (N + 1) – N expressing price differentials | | | | | | | |
| | Unit price differentials | Q (N + 1) | Total | Unit price differentials | Q (N + 1) | Total | |
| Consumption of materials | - 15 | 43 000 t | - 645 000 | Sales P1 | - 0,2 | 1 320 000 | - 264 000 |
| Payroll | + 0,8 | 850 000 h | + 680 000 | Sales P2 | + 0,1 | 770 000 | + 77 000 |
| Taxes | + 0,1 | 2 090 000 u | + 209 000 | | | | |
| Financial charges | + 0,004 | 21 250 000 | + 85 000 | | | | |
| Depreciation | — | | | | | | |
| Net income | + 0,02 | 16 300 000 | +326 000 | | | | |
| | | | <u>655 000</u> | GPS | | | <u>+ 842 000</u> |
| | | | | | | | 655 000 |

Exhibit 4.

| Income Statement | | | | | |
|-----------------------------|-----------|---------------------------|----------------------|-----------|---------------------------|
| Gains to be distributed | | | Distributed to | | |
| | in FF | in % produc- tion N | | in FF | in % produc- tion N |
| GPS | 842 000 | 4,21 | In favor of | | |
| Contribution from suppliers | 645 000 | 3,225 | P1 purchasers | 264 000 | 1,32 |
| P2 purchasers | 77 000 | 0,385 | Payroll | 680 000 | 3,4 |
| | 1 564 000 | 7,82 | The state | 209 000 | 1,045 |
| | | | Providers of capital | 85 000 | 0,425 |
| | | | Owners | 326 000 | 1,63 |
| Available amount | | | Distributed amount | 1 564 000 | 7,82 |



Corail train for Year N and a TGV (high-speed train) for Year (N + 1). To “make” things comparable, we must devise a common yardstick, for example:

1 km/passenger on TGV = 2 km/passenger on Corail.

If the former runs twice as fast as the latter and if the speed differential is considered a major determinant, such relations are bound to generate fairly unreliable results.

Inflation

Price differentials may be approached in two different ways:

1. The variation in the price of an article, aside from other prices (variation in relative prices); such price variations have always existed, even without inflation.
2. The price spread for a set ("a basket") of goods or services reflecting overall market prices; they are indicators of the evolution of the purchasing power of the currency.

It is obvious that a "contribution" or "benefit transfer" will occur only if and when the transaction price with a third party changes faster than the overall price level. One may ignore arguments as to the validity of indexes and even as to the fact that an index, however relevant, will never accurately reflect the inflation applying to any specific economic agent, since no two agents ever have the same structure in terms of consumption.

We therefore suggest expressing unit prices and amounts for Year 1 in Year 2 francs by multiplying them by the ratio of consumer price indexes. With a 10 percent inflation rate for those two years, the figures will read as follows:

| Year | Quantities | Unit prices | Value |
|-----------------|------------|-------------|---------------------------|
| 1 | 5 000 | 500 | 2 500 000 (Year 1 francs) |
| 1 ¹⁸ | 5 000 | 550 | 2 750 000 (Year 2 francs) |
| 2 | 5 500 | 580 | 3 190 000 (Year 2 francs) |

The price increase expressed in inflation adjusted francs actually amounts to

$$(580 - 550)/550 \times 100 = 5.45 \text{ percent}$$

One should not be deluded by the apparent simplicity of the example. The conversion to current value of fixed assets — whose gross value expresses the volume corresponding to the depreciation allowance¹⁹ — raises both practical and methodological problems which are quite complex indeed.

¹⁸ Adjusted for inflation.

¹⁹ Assuming that the gross operating profit is separated into specific items, such calculations are not made by all specialists.

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¹ William A. Dymsza, Multinational Business Strategy (New York: McGraw-Hill, 1972), 49-53.

² Geoffrey Holmes, "Replacement Value Accounting," Accountancy (March 1972), 4-8.

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Audit Firm Size and Audit Quality: Some Evidence from Mexico

CHEE W. CHOW and ADRIAN WONG-BOREN*

This study investigates the effect of audit firm size on Mexican bank loan officers' perception of audit quality. The objective is to contribute insight into the nature of and the market for audit services. In addition, this study seeks to enhance understanding of the accounting environment in non-Anglo-American nations. The need for cross-national studies of accounting institutions has long been emphasized.¹ As national economies become more and more interdependent through trade and other exchanges, an understanding of the institutions of one's trading partners becomes increasingly important. Knowing how institutions function and develop in other countries can also help one to understand the process in one's own nation.

Audit firm size is worthy of study because it has been the focus of considerable attention in recent years. In the United States, the U.S. Senate's Staff Study has criticized the "... extraordinary degree of concentration among the 'big eight' firms in providing auditing services to major corporations."² The report stated that

* Chee W. Chow is the Vern Odmark Professor of Accountancy, School of Accountancy, San Diego State University.

Adrian Wong-Boren is Assistant Professor of Accountancy, School of Accountancy, San Diego State University.

The authors are indebted to Kamal Haddad for his assistance with data analysis.

¹ Frederick D. S. Choi and Gerhard G. Mueller, *An Introduction to Multinational Accounting* (Englewood Cliffs, N.J.: Prentice-Hall, 1978); and Hanns-Martin W. Schoenfeld, "International Accounting: Development, Issues and Future Directions," *Journal of International Business Studies* (Fall 1981), 83-100.

² United States Senate, Subcommittee on Reports, Accounting and Management of the Committee on Governmental Affairs, *Accounting Establishment: A Staff Study* (Washington, D.C.: U.S. Government Printing Office, 1976), 36.

there was "... little evidence that they [the 'Big Eight' firms] serve the public or that they are independent in fact from the interests of their corporate clients"³ and called for "... further investigation into the anti-competitive effects which may reasonably be expected to result from such concentration."⁴ The American Institute of Certified Public Accountants (AICPA) has also demonstrated concern about the audit firm size issue by appointing a Special Committee on Small and Medium Sized Firms. The report of this committee expressed the view that "... smaller firms may be replaced simply because they are less well known, even though the smaller firms may well be providing as high or higher quality services."⁵ To alleviate this "problem," the committee recommended publication of a booklet to stress "... that the selection of a CPA firm should be based not on size, but on the ability to provide service."⁶

Contrary to the expressed views of these official bodies, analyses by Benston, DeAngelo, Fama and Jensen, and Watts and Zimmerman have suggested that audit quality increases with audit firm size.⁷ Since this conclusion can have significant policy implications, its validity is worthy of empirical investigation. The present study provides an indirect test of the proposition that larger audit firms provide higher quality audits than do smaller firms. The empirical findings are consistent with this proposition.

AUDIT FIRM SIZE AND AUDIT QUALITY: ANALYSIS

Modern firms are characterized by a separation of ownership and management. This arrangement gives rise to agency costs due to potential interest conflicts between management and non-managing owners and across classes of owners.⁸ Since part of these agency

³ Ibid., 4.

⁴ Ibid., 43.

⁵ American Institute of Certified Public Accountants, *Report of the Special Committee on Small and Medium Sized Firms* (New York: AICPA, 1980), 5.

⁶ Ibid., 18.

⁷ G. Benston, "The Market for Public Accounting Services: Demand, Supply and Regulation," *Accounting Journal* (Winter 1979-80), 2-46; L. DeAngelo, "Auditor Size and Audit Quality," *Journal of Accounting and Economics* (December 1981), 183-99; E. Fama and M. Jensen, "Agency Problems and Residual Claims," *Journal of Law and Economics* (June 1983), 327-50; and R. Watts and J. Zimmerman, "Agency Problems, Auditing and the Theory of the Firm: Some Evidence," *Journal of Law and Economics* (October 1983), 613-34.

⁸ E. Fama and M. Miller, *The Theory of Finance* (Hinsdale, Ill.: Dryden Press, 1972); M. Jensen and W. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* (October 1976), 305-60; and E. Fama and M. Jensen, "Separation of Ownership and Control," *Journal of Law and Economics* (June 1983), 327-50.

costs represents a dead-weight loss, incentives exist to control them through voluntary contracting between managers and owners (e.g., compensation contracts) and across classes of owners (e.g., debt covenants). These contracts are often expressed in terms of accounting numbers.⁹ Since firm management probably already generates much of the accounting information embodied in these contracts, having management supply the required numbers to external users can reduce the costs of manager-owner and intra-owner contracting. Because the contracts impose controls on the manager, however, he or she has incentives to bias the accounting numbers in his or her own favor. The demand for external auditing to monitor and control the integrity of the external reporting function thereby arises.¹⁰

The preceding analysis suggests that the demand for external auditing is a derived demand. Further, auditing is of value only to the extent it is perceived to sustain the integrity of external financial reporting — otherwise, external users will place little value on audited reports as monitoring devices. DeAngelo, and Watts and Zimmerman suggest that the ex ante value of an external audit depends on financial statement users' perception regarding the auditor's ability both (1) to discover errors or breaches in the accounting system, and (2) to withstand client pressures to disclose selectively in the event a breach or error is discovered.¹¹ The former is a function of technical capabilities. To the extent economies of scale exist,¹² larger audit firms may be able to supply a given level of audit quality at a lower cost than can smaller audit

⁹ R. Watts, "Corporate Financial Statements: A Product of the Market and Political Processes," *Australian Journal of Management* (April 1977), 53–75; C. Smith and J. Warner, "On Financial Contracting: An Analysis of Bond Covenants," *Journal of Financial Economics* (June 1979), 117–61; Benston, "Public Accounting Services"; C. Chow, "The Demand for External Auditing: Size, Debt and Ownership Influences," *Accounting Review* (April 1982), 272–91; R. Leftwich, "Accounting Information in Private Markets: Evidence from Private Lending Agreements," *Accounting Review* (January 1983), 23–42.

¹⁰ Jensen and Meckling, "Theory of the Firm"; Watts, "Corporate Financial Statements"; Benston, "Public Accounting Services"; Chow, "External Auditing."

¹¹ L. DeAngelo, "Auditor Independence, 'Low Balling,' and Disclosure Regulation," *Journal of Accounting and Economics* (August 1981), 113–27; and R. Watts and J. Zimmerman, "The Markets for Independence and Independent Auditors" (University of Rochester, March 1981).

¹² Benston, "Public Accounting Services"; D. Simunic, "The Pricing of Audit Services: Theory and Evidence," *Journal of Accounting Research* (Spring 1980), 161–90; J. Eichenseher and P. Danos, "The Analysis of Industry-Specific Auditor Concentration: Towards an Explanatory Model," *Accounting Review* (July 1981), 479–92; and P. Danos and J. Eichenseher, "Audit Industry Dynamics: Factors Affecting Changes in Client Industry Market Shares," *Journal of Accounting Research* (Autumn 1982), 604–16.

firms. This factor alone does not necessarily imply that larger audit firms will supply higher quality audits, however; these firms can supply the same audit quality at lower fees or higher profit. The second factor mentioned, the conditional probability of reporting a discovered breach or error, can be seen as a measure of auditor independence.¹³ Holding audit technology constant, this second factor is a key determinant of audit quality. How auditor independence considerations may increase larger audit firms' competitive advantage in providing higher audit quality is discussed later.

Incentives for Audit Quality Specialization

DeAngelo and Chow observe that the cost of using external financial reports includes evaluating audit quality.¹⁴ The more costly it is to differentiate audit quality, the smaller is the net benefit from external audits. Suppliers of audit service have incentives to reduce this cost. DeAngelo notes:

If auditors substantially vary the level of audit quality supplied from period to period, consumers [of audited financial reports] would have to reevaluate quality over time. If auditors substantially vary the level of quality from client to client, each audit engagement would require separate evaluation by consumers. . . . Because quality evaluation is costly, consumers will compensate auditors who enable them to avoid these costs by maintaining a relatively uniform quality level. Auditors have incentives to specialize in a uniform quality level because they can capture higher fees by doing so.¹⁵

Chow makes a similar observation.¹⁶ Further, both DeAngelo and Chow argue that due to demand-side considerations, a range of audit qualities will coexist in the market — all business firms do not have the same agency costs, so they also do not demand the same level of audit quality.¹⁷ This condition implies that different auditors can specialize in different (though uniform) quality levels. Another implication of audit quality specialization is that an audit client who wishes to purchase a different level of audit quality will find it necessary to change auditors. DeAngelo reports evidence on auditor switches, which is consistent with this analysis.¹⁸

Chow notes that an added advantage from audit quality spe-

¹³ DeAngelo, "Auditor Independence"; and Watts and Zimmerman, "Markets for Independence."

¹⁴ DeAngelo, "Auditor Size"; and C. Chow, "On the Measurement of Auditing Standards," *Journal of Business Finance and Accounting* (Spring 1983), 21-35.

¹⁵ DeAngelo, "Auditor Size," 187.

¹⁶ Chow, "Measurement of Auditing Standards," 23.

¹⁷ DeAngelo, "Auditor Size," and Chow, "Measurement of Auditing Standards."

¹⁸ L. DeAngelo, "Mandated Successful Efforts and Auditor Choice," *Journal of Accounting and Economics* (December 1982), 171-204.

cialization is reduced costs of monitoring the auditor.¹⁹ He notes that if each auditor supplies a range of alternate audit qualities, it can be costly to ascertain whether there has been an abrogation of duties in a given audit, or merely that a lower audit quality had been contacted for and supplied. This consideration provides one of the major reasons why larger audit firms can be expected to specialize in higher levels of audit quality.

Audit Firm Size and Audit Quality Specialization

Holding audit technology constant, audit quality increases with an audit firm's perceived independence from clients (i.e., the ability to resist pressures for selective reporting of discovered breaches or errors). Studies by Benston, DeAngelo, Watts and Zimmerman, and Fama and Jensen suggest two major reasons why larger audit firms have a competitive advantage in providing higher quality audits: they have both greater ability and greater incentive to maintain independence from clients.²⁰

The first reason is relatively straightforward. Holding client size constant, larger audit firms derive smaller percentages of their total income from a particular client. As such, they are less susceptible to pressures from any particular client. This is the observation of the AICPA's Commission on Auditors' Responsibilities: "When one or a few large clients supply a significant portion of the total fees of a public accounting firm, the firm will have greater difficulty in maintaining its independence."²¹ DeAngelo provides an additional reason why larger audit firms are more apt to resist client pressure:

When partners share proportionally in audit firm profits, the greater the number of clients, the less the wealth of the partner-in-charge of a given client depends on retaining that client. Therefore, the greater is the probability that he will report a discovered breach. In effect, the impact of his audit decisions on his personal wealth is reduced.²²

Not only are larger audit firms better able to withstand pressures from individual clients, but also they are more likely to do so. The reason is that larger audit firms have more to lose (or conversely, more to gain) from lax (strict) application of auditing and reporting

¹⁹ Chow, "Measurement of Auditing Standards," 23-24.

²⁰ G. Benston, "Accountant's Integrity and Financial Reporting," *Financial Executive* (August 1975), 10-14; L. DeAngelo, "Auditor Independence"; Watts and Zimmerman, "Markets for Independence"; and Fama and Jensen, "Agency Problems."

²¹ American Institute of Certified Public Accountants, *Report, Conclusions, and Recommendations of the Commission on Auditors' Responsibilities* (New York: AICPA, 1978), 113-14.

²² DeAngelo, "Auditor Independence," 191-92.

standards. First, audit firms are liable for investor losses arising out of fraudulent or misleading financial statements.²³ Since larger audit firms probably have more collective wealth among their partners, outsiders are more likely to search statements certified by larger audit firms for indications of negligence or misconduct. Legal liability aside, larger audit firms have more to lose than smaller firms from damages to their "brand name." DeAngelo proposes that, due to the start-up costs of new audits, incumbent auditors have a competitive advantage in retaining current clients.²⁴ As a result, incumbent auditors are able to earn client-specific quasi-rent; that is, they can charge more than the avoidable costs of providing the audit. Thus, if an auditor is replaced, his or her wealth would be reduced by the present value of this quasi-rent stream.

Benston, DeAngelo, Watts and Zimmerman, and Fama and Jensen suggest that the potential loss of quasi-rents serves as a kind of collateral which motivates auditors to resist pressures from individual clients.²⁵ Earlier, it was observed that the value placed on an audit depends on the auditor's perceived ability both to discover breaches and errors and to report them. If an auditor yields to pressures from a particular client and is discovered, the value of the auditor's services to the remaining clients would be reduced (since financial statement users would discount reports certified by that auditor more heavily). An auditor who relaxes auditing and reporting standards to retain a client faces a potential loss of other clients and/or demands for lower fees (to reflect the reduced value of the services). Since larger audit firms have more clients, they also face greater losses from damages to their reputations. As a result, they have greater incentives to resist client pressures for selective reporting.

To summarize, audit firms have incentives to specialize by audit quality; doing so reduces users' costs of quality differentiation, thus increasing the net value of external auditing. Larger audit firms have a comparative advantage and greater incentives to specialize at higher quality levels. In part, this derives from their greater ability to sustain pressures from (and the potential loss of)

²³ Benston and Causey provide descriptions of auditor liability rules in the United States. See G. Benston, *Corporate Financial Disclosure in the UK and the USA* (Westmead, England: Saxon House, 1976), and D. Causey, *Duties and Liabilities of Public Accountants* (Homewood, Ill.: Dow-Jones Irwin, 1979).

²⁴ DeAngelo, "Auditor Size."

²⁵ Benston, "Accountants' Integrity"; DeAngelo, "Auditor Size"; Watts and Zimmerman, "Markets for Independence"; and Fama and Jensen, "Agency Problems."

individual clients. In part, larger audit firms have more to lose from lax auditing and/or reporting; they have greater potential exposure to legal liability, and they face greater losses from damages to their reputations.

To evaluate whether larger audit firms do provide higher quality audits, bank loan officers were surveyed as to the relative importance they placed on financial items audited by large versus small audit firms. This indirect approach was chosen because available, direct measures of audit quality are fraught with measurement problems.²⁶ In using perceived rather than actual audit quality, however, the study is a joint test of two propositions: that audit quality increases with audit firm size, and that perceived and actual audit quality are positively related. Since we are dealing with experienced bank loan officers, their perceptions are likely to have some correspondence to reality.

Mexico was chosen as the research site for two major reasons. First, the Mexican accounting environment has not been subject to much empirical research. This study may enhance researchers' understanding of the Mexican accounting setting. By doing so, the study may facilitate further analysis of the institutions and practices in Mexico. Evidence from such studies can augment comparative analyses across countries and shed further light on the economic determinants of accounting policies and practice (i.e., help to develop a "positive theory" of accounting as discussed in Watts and Zimmerman).²⁷ The discussions in Benston, and Nair and Frank are also pertinent.²⁸ Second, relative to the more frequently researched countries, the accounting environment in Mexico is much less regulated (see the next section). Since regulations may restrict the range of audit qualities available for specialization (e.g., by effectively putting a floor on the audit qualities that auditors and clients are willing to trade), the incremental effects of a single variable, such as audit firm size, may be difficult to detect in a highly regulated setting. In contrast, a wider range of audit qualities is likely to exist in Mexico, thus facilitating a test of our theoretical analysis.

²⁶ See Chow, "Measurement of Auditing Standards."

²⁷ R. Watts and J. Zimmerman, *Positive Accounting Theory* (Englewood Cliffs, N.J.: Prentice-Hall, 1986).

²⁸ Benston, *Corporate Financial Disclosure*; and R. Nair and W. Frank, "The Impact of Disclosure and Measurement Practices on International Accounting Classifications," *Accounting Review* (July 1980), 426-50.

RESEARCH METHOD

The Mexican Accounting Environment

Institutions. Accounting in Mexico²⁹ is regulated by a number of public and quasi-public institutions. Various federal agencies, some of them industry specific, are empowered to regulate the operations of business firms. For example, the National Commission of Banking and Insurance Companies oversees the operations and financial disclosure of banks and insurance companies. However, the institution with the most far-reaching impact is the Ministry of Finance and Public Credit (SHCP). This ministry administers the Mexican income tax law through a number of divisions. One of these, the General Auditing Division, has had a particularly strong impact on accounting practices. This impact arose because the Mexican Federal Tax Code established a procedure to facilitate the official review of corporate tax whereby business enterprises may file financial statements that have been certified by a Mexican public accountant registered with the SHCP. Filing such statements greatly reduces the probability of lengthy, direct audits by the tax authorities. As a result, most larger companies have adopted this practice.³⁰

Another agency of the SHCP is the National Securities Commission (NSC). This commission administers the Mexican Securities Market Law, which covers the public offering and trading of securities, the operations of the Mexican Stock Exchange (a private corporation), and the activities of securities brokers and dealers. To have its securities approved by the NSC, a company is required to file a prescribed set of financial and nonfinancial information (to be discussed further). Subsequently, audited financial statements

²⁹ More detailed discussions of the institutional aspects of Mexican accounting are contained in American Institute of Certified Public Accountants, *Professional Accounting in 30 Countries* (New York: AICPA, 1975), 367–87; Institute of Chartered Accountants in England and Wales, *A Survey of 46 Countries* (London: ICAEW, 1976); Price Waterhouse, "Doing Business in Mexico," *Information Guide* (New York: PW, 1981); Ernst and Whinney, *International Series — Mexico* (New York: EW, 1983); and Instituto Mexicano de Contadores Publicos, *Campo de Actuación Profesional del Contador Público en México (Job Possibilities for Certified Accountants in Mexico)* (Mexico City: Editorial Instituto Mexicano de Contadores Publicos, Mexico, 1985).

³⁰ Zeff notes that the Mexican tax laws have impacted Mexican corporate reporting in three major ways: (1) in some cases, the laws have insisted that financial and tax accounting be identical; (2) the laws have specified particular accounting practices in some cases, and this has carried over into financial reporting; and (3) many companies have simply issued the same set of financial reports for tax and external reporting purposes. See S. Zeff, *Forging Accounting Principles in Five Countries: A History and An Analysis of Trends* (Champaign, Ill.: Stipes Publishing, 1972).

must be filed annually and published in a nationally circulated news medium.³¹

Quasi-public institutions with a major impact on Mexican accounting practices include the Mexican Stock Exchange (MSE), the Mexican Institute of Certified Public Accountants (IMCP), and the Mexican Institute of Financial Executives (IMEF). The MSE is the only organized securities exchange in Mexico. Only NSC-approved securities can be listed on the exchange. Thus, listing on the MSE requires compliance with the NSC's reporting rules. In addition, the MSE requires filing quarterly statements, although these do not have to be CPA certified.³²

The IMCP is a federation of the local CPA societies, which may be established in any locality with at least one hundred registered certified public accountants. The IMCP is officially recognized as the governing body of the accounting profession in Mexico. Through a number of standing committees, the IMCP promulgates generally accepted accounting principles, auditing standards, and rules of ethics.³³

The IMEF is an association of senior Mexican financial executives. With the MSE, the IMEF has a representative on the IMCP committee on accounting principles. In addition, the IMEF publishes a monthly journal which expresses its membership's views on accounting matters.

Regulations and practice. Nair and Frank observe that Mexican accounting practices are patterned after the U.S. model.³⁴ Disclosure requirements in Mexico primarily emanate from the NSC in the form of "circulars" (similar to the U.S. Securities and Exchange Commission's Accounting Series Releases). Appendix A lists the major NSC disclosure requirements that are in effect. Although the list of requirements is long, the requirements are still quite limited compared to what most larger U.S. firms are required to disclose.³⁵

³¹ More details on the reporting requirements are contained in the Securities Market Law (Diario Oficial de la Federación, *Ley del Mercado de Valores* (Securities Market Law) (Mexico City: Talleres Graficos de la Nación, 1975).

³² The regulations of the Mexican Stock Exchange are contained in Editorial Porrúa, *Reglamento Interior de la Bolsa de Valores, S.A. de C.V.* (Ruling of the Stock Exchange) (Mexico City: Editorial Porrúa, 1982).

³³ The IMCP is officially recognized by the "Federación de Colegios de Profesionistas" (Federation of Professional Societies), which is regulated by the General Law of Professions ("Ley General de Profesiones"). The IMCP makes it clear that the accounting principles, auditing norms, circulars, etc., that it issues are normative in nature.

³⁴ Nair and Frank, "Impact of Disclosure," 426-50.

³⁵ Benston provides an extensive discussion of accounting regulations and practice in the United States. See Benston, *Corporate Financial Disclosure*.

The NSC circulars focus on items to be disclosed; they are mostly silent on issues of accounting method. Nor are there federal or state laws that specifically regulate accounting practices. The primary authority on generally accepted accounting principles appears to be the quasi-public IMCP, which has issued a number of formal statements (see Appendix B). As with the NSC requirements, the coverage of these statements seems far more restricted than their U.S. counterparts.

To assess the state of accounting practice in Mexico (including compliance with regulations), we conducted an extensive search of the published accounting and business literature.³⁶ We could find no study covering the most recent decade. As an alternative, we conducted informal interviews with the managing partners of seven Mexican CPA firms. The conclusion that emerged was one of frequent accounting manipulations and lax enforcement. This is consistent with the expressed concerns of a member of the IMCP's Accounting Principles Commission, who criticized Mexican firms' general disregard for accounting and disclosure standards and called for new regulatory mechanisms and stricter enforcement.³⁷ Although anecdotal evidence such as this is insufficient for deriving general conclusions, in conjunction with the findings regarding authoritative pronouncements, it does indicate a more laissez faire accounting environment than that in the United States.

Survey Instrument and Procedure

This study focused on bank loan officers because they are a major group of financial report users in Mexico.³⁸ To assess their perceptions regarding auditor size and audit quality, three steps were undertaken: (1) constructing a comprehensive list of financial and nonfinancial items that may be used in business loan applications; (2) obtaining loan officers' assessed importance of each item in evaluating a loan, where the financial items are either audited by

³⁶ Our primary source was the Business Periodicals Index from 1978 to 1985. We also searched selected Mexican business publications and accounting texts.

³⁷ C. A. Soni, "Estudios y Comentarios Sobre la Informacion Financiera Proporcionados por las Emisoras al Mercade de Valores" ("Analysis and Commentary on Accounting Information Provided by Companies Listed on the Mexican Stock Exchange"), *Contaduria Publica* (November 1981), 26-27.

³⁸ Another user group we considered was financial analysts. Unfortunately, we were unable to obtain a sample from this group. In any event, loan officers represent a very important segment of financial statement users in Mexico. Zeff observes that many Mexican companies are reluctant to make public securities offerings because of the required financial disclosures. Banks are the preferred source of capital to avoid publicly disclosing sensitive financial information. See Zeff, *Forging Accounting Principles*.

a large national CPA firm or a small local firm; and (3) testing whether financial items are accorded more importance when a larger CPA firm performs the audit.

A comprehensive list of items (both financial and nonfinancial) that firms may potentially disclose to external users was constructed by referring to the pronouncements of the Mexican accounting authorities, Mexican accounting texts, and prior studies by Choi, Buzby, Barrett, Firth, and McNally, Eng, and Hasseldine.³⁹ The preliminary list was reviewed by the credit department heads from eight Mexican banks. Based on their input, a final list of eighty-nine items was compiled.

Cooperation was obtained from the credit department heads of sixteen Mexican banks, who distributed 106 (anonymous) instruments to loan officers in their departments. To limit the effects of any particular case a respondent may have experienced, the loan officers were asked to indicate the importance they placed on each item in evaluating an "average" business loan application. A seven-point scale was used, with these end points: "of no importance at all" (1) and "of utmost importance" (7). Order effects were controlled by using eight random orders in listing the items. Audit firm size was introduced as a between-subjects variable. Half of the surveys specified that the audited items from the list were certified by one of the largest national (but unnamed) CPA firms in Mexico. The other half indicated use of a small, local CPA firm (also unnamed). There were also questions on the respondents' work experience.

RESULTS

Respondent Characteristics

A total of sixty-seven completed responses was received (a 63 percent response rate). Exhibit 1 presents demographic data for respondents who completed the "national CPA" instrument ($N =$

³⁹ Frederick D. S. Choi, "Financial Disclosure and Entry to the European Capital Market," *Journal of Accounting Research* (Autumn 1973), 159-75; S. Buzby, "Company Size, Listed versus Unlisted Stocks, and the Extent of Financial Disclosure," *Journal of Accounting Research* (Spring 1975), 16-37; E. Barrett, "Financial Reporting Practices: Disclosure and Comprehensiveness in an International Setting," *Journal of Accounting Research* (Spring 1976), 10-26; M. Firth, "The Impact of Size, Stock Market Listing, and Auditors on Voluntary Disclosure in Corporate Annual Reports," *Accounting and Business Research* (Autumn 1979), 273-80; and G. McNally, L. Eng, and C. Hasseldine, "Corporate Financial Reporting in New Zealand: An Analysis of User Preferences, Corporate Characteristics and Disclosure Practices for Discretionary Information," *Accounting and Business Research* (Winter 1982), 11-20.

Exhibit 1. Demographic Variables and Tests of Intergroup Difference

| Variable | Sample | | t-statistic | Wilcoxon Z-statistic |
|--|------------------|------------------|-----------------|-------------------------|
| | "Local" | "National" | | |
| Years of experience | 5.2 (4.2)* | 4.2 (3.5)* | 0.92 (0.36)† | -0.79 (0.43)† |
| Average size of loan evaluated‡ | 37992 (65040) | 50449 (17250) | -0.57 (0.57) | -1.03 (0.31) |
| Average number of loans processed per year | 66.6 (58.4) | 133.9 (187.1) | -1.69 (0.10) | -1.66 (0.10) |

Note: * = standard deviation.

† = two-tailed significance.

‡ = in U.S. dollars using an exchange rate of 300 pesos to one dollar.

35) and those responding to the "local CPA" version (N = 32). Both groups indicated considerable loan evaluation experience. Exhibit 1 also presents the results of statistical tests, which revealed no significant difference in work experience between the two groups.⁴⁰

Perceived Importance of Disclosure Items

Exhibit 2 presents the mean perceived importance of each disclosure item for the "national" and "local" samples. The eighty-nine items are divided among three panels: Panel A contains the eighteen financial items that are subject to external audit (denoted F-A); Panel B consists of the thirty-two financial items not subject to external audit (denoted F-NA); and Panel C is composed of the remaining thirty-nine items which are both nonfinancial and not subject to external audit (denoted NF-NA).

The data in Exhibit 2 reveal a wide range of importance ratings across disclosure items. For example, within Panel A, the mean rating assigned by the "local" sample ranges from a high of 6.125 ("Statement of sources and uses of funds") to a low of 3.129 ("Information relating to the company's employee pension plan"). The same two items are also accorded the highest (6.5429) and lowest (3.3429) mean ratings, respectively, by the "national" sample. This pattern suggests that the two samples ascribe similar relative importance across items. This consensus is indicated by

⁴⁰ All of the responses were returned within a two-week period. Thus, it was not feasible to conduct crude tests of nonresponse bias, such as comparing "early" and "late" responses. See A. Oppenheim, *Questionnaire Design and Attitude Measurement* (New York: Basic Books, 1966).

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference

| Item | Panel A Financial — Audited | | t- statistic | Wilcoxon (z-statistic) |
|--|--------------------------------|----------|------------------------------|---------------------------|
| | Sample | | (Two-tailed significance) | |
| | Local | National | (Sig.) | (Sig.) |
| Amount and breakdown of operating expenses | 4.9063 | 5.1429 | -0.60 (.276) | -0.56 (.286) |
| Cost of goods sold | 5.3750 | 6.3429 | -2.65 (.005) | -2.49 (.006) |
| Inflation adjusted annual accounts as supplementary statements | 4.7419 | 5.3429 | -1.78 (.040) | -1.67 (.047) |
| Earnings per share | 3.2813 | 3.5714 | -0.69 (.247) | -0.72 (.235) |
| Method used to determine allowance for doubtful debts | 3.1563 | 4.8857 | -4.21 (.000) | -3.64 (.040) |
| Gains and losses from holding non-monetary assets | 3.9655 | 4.1429 | -0.45 (.334) | -0.47 (.318) |
| Statement of sources and uses of funds | 6.1250 | 6.5429 | -1.38 (.087) | -1.91 (.028) |
| Information on the original cost, accumulated depreciation, and depreciation for the past year, on the firm's assets | 4.5313 | 4.8000 | -1.17 (.240) | -1.45 (.188) |
| Information relating to the company's employee pension plan | 3.1290 | 3.3429 | -0.54 (.296) | -0.55 (.290) |
| The dollar amounts of cash the company must leave on deposit in banks under borrowing agreements (i.e., compensating balances) and their durations | 5.0000 | 5.8000 | -2.06 (.021) | -1.59 (.055) |
| Breakdown of inventories into raw materials, goods in process, and finished goods | 5.3548 | 5.7714 | -0.96 (.170) | -0.89 (.187) |
| Current market value of quoted investments | 3.9063 | 4.5714 | -1.57 (.061) | -1.67 (.047) |
| Allowance for losses in currency exchange transactions | 4.5625 | 5.5714 | -2.93 (.002) | -2.58 (.004) |
| Allowance for doubtful debts | 3.8438 | 4.4706 | -1.61 (.056) | -1.51 (.065) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample | | t- statistic | Wilcoxon (z-statistic) |
|--|--------|----------|--|---------------------------|
| | Local | National | (Two-tailed significance) (Sig.) | (Sig.) |
| Market value of inventory | 5.4375 | 5.6286 | -0.55 (.292) | -0.84 (.201) |
| Information about debts in foreign currency | 6.0000 | 5.9429 | 0.18 (.478) | -0.10 (.459) |
| Information on contingent liabilities | 4.0000 | 5.0286 | -2.72 (.004) | -2.46 (.007) |
| Breakdown of the firm's tangible and intangible assets | 3.6250 | 4.8529 | -3.77 (.000) | -3.03 (.001) |
| Panel B | | | | |
| Financial — Non-Audited | | | | |
| Breakdown of sales revenue by major product lines, customer classes, and geographical location | 4.4063 | 4.4857 | -0.19 (.475) | -0.07 (.472) |
| Information relating to investments (e.g., names, percentage ownership) | 4.1935 | 5.4000 | -3.74 (.000) | -3.32 (.000) |
| Index of raw materials' prices | 4.2258 | 4.6176 | -0.91 (.183) | -0.90 (.183) |
| The dollar amounts of unused lines of credit available to the company from banks or insurance companies at the end of the year | 4.8387 | 5.4857 | -1.71 (.046) | -1.75 (.040) |
| Specification of the method used to amortize tangible assets | 3.1563 | 3.4000 | -0.59 (.278) | -0.51 (.304) |
| Long or short position in foreign currency | 4.7742 | 5.2571 | -1.14 (.128) | -1.14 (.128) |
| Comparative figures (from previous year) for the balance sheet | 5.8438 | 6.5429 | -2.82 (.003) | -3.10 (.000) |
| Analysis of sales revenue and earnings attributable to foreign operations | 4.7188 | 5.1176 | -1.01 (.159) | -1.18 (.119) |
| Comparative figures (from previous year) for the profit and loss account | 6.3125 | 6.4857 | -0.64 (.262) | -0.90 (.183) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample | | t- statistic | Wilcoxon (z-statistic) |
|---|--------|----------|--|---------------------------|
| | Local | National | (Two-tailed significance) (Sig.) | (Sig.) |
| Amount of each subsidiary's earnings for the past year and the parent company's share of each amount | 5.0313 | 4.9429 | 0.22 (.412) | -0.17 (.433) |
| Breakdown of expenses for past year into fixed and variable components | 4.5000 | 4.7143 | -0.54 (.196) | -0.59 (.276) |
| Dividends per share for the present period | 3.3125 | 3.5882 | -0.63 (.265) | -0.58 (.281) |
| Historical summary of important operating and financial data | 4.5938 | 5.5143 | -2.60 (.006) | -2.12 (.017) |
| Statement of the rate of return required by the company on its projects | 4.8065 | 5.4857 | -1.64 (.053) | -1.22 (.111) |
| Extent of dependence on a few customers | 4.9688 | 4.8571 | 0.27 (.393) | -0.37 (.355) |
| Discussion of the major factors which will influence next year's results including an indication of the firm's relationship to its industry and the economy | 5.1875 | 5.5143 | -0.81 (.211) | -0.70 (.241) |
| Information relating to capital expenditures (e.g., expenditure in past year, planned expenditures) | 5.2813 | 5.1429 | 0.38 (.351) | -0.51 (.304) |
| Current resale value of the firm's assets | 4.4688 | 5.0857 | -1.77 (.041) | -1.35 (.085) |
| Breakdown of borrowings (e.g., lending institution, date of maturity, security) | 5.9688 | 6.4000 | -1.38 (.081) | -1.39 (.082) |
| Information about the leasing of assets | 4.6250 | 4.7714 | -0.38 (.351) | -0.31 (.377) |
| Assets given as collateral to others | 5.9677 | 6.0286 | -0.22 (.413) | -0.00 (.497) |
| Amount of past pension fund liability | 3.1563 | 3.2286 | -0.18 (.428) | 0.13 (.446) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample Local National | | t- statistic (Two-tailed significance) (Sig.) | Wilcoxon (z-statistic) (Sig.) |
|---|-----------------------------|--------|---|-------------------------------------|
| | | | (Sig.) | (Sig.) |
| Specification of the method used to compute depreciation | 3.7000 | 4.0286 | -0.78 (.218) | -0.82 (.206) |
| Historical summary of price range of ordinary shares in past few years | 3.1290 | 3.4286 | -0.80 (.212) | -0.87 (.192) |
| Forecast of next year's profits | 5.3750 | 6.0000 | -1.66 (.050) | -1.87 (.030) |
| Index of sales prices | 3.7742 | 4.6765 | -2.06 (.022) | -1.90 (.028) |
| Overall financing cost | 4.9063 | 5.5714 | -1.96 (.027) | -2.46 (.007) |
| Nature and dollar effects of all major accounting changes made during the past year | 4.6563 | 4.8857 | -0.61 (.273) | -0.38 (.353) |
| Cash projections for the next one to five years | 5.4516 | 5.8004 | -0.88 (.278) | -0.77 (.304) |
| Method used to determine cost of inventories | 4.7097 | 4.9714 | -0.61 (.271) | -0.59 (.276) |
| Capitalized interests during the period | 4.6875 | 5.1429 | -1.35 (.091) | -1.28 (.100) |
| A statement of transactions in foreign currency | 4.8125 | 5.6000 | -1.95 (.028) | -2.14 ^a (.016) |
| Panel C | | | | |
| Nonfinancial — Non-Audited | | | | |
| Number of shares in the company owned by its officers | 2.9677 | 4.4571 | -3.62 (.000) | -3.24 (.000) |
| Information relating to advertising and publicity (e.g., expenditures in past year, future commitments) | 3.7188 | 4.0000 | -0.82 (.206) | -0.86 (.195) |
| Index of sales quantity | 4.3226 | 4.8824 | -1.36 (.090) | -1.14 (.125) |
| Description about plant and equipment under construction | 4.7500 | 5.1714 | -1.22 (.113) | -1.21 (.113) |
| Discussion of the impact of inflation on the financial results | 5.0313 | 5.6000 | -1.70 (.047) | -1.92 (.027) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample | | t- statistic | Wilcoxon (z-statistic) |
|--|--------|----------|--|---------------------------|
| | Local | National | (Sig.) (Two-tailed significance) | (Sig.) |
| Market share of the main products sold by the firm | 5.7188 | 5.6286 | 0.24 (.406) | -0.38 (.351) |
| Amount expended on human resources (training, welfare facilities) | 3.5313 | 5.0000 | -3.80 (.000) | -3.39 (.000) |
| Information relating to subsidiaries (e.g., names, addresses, percentage ownership) | 4.9063 | 5.0857 | -0.44 (.330) | -0.15 (.438) |
| A statement of money exchanges with the government | 4.5625 | 4.8286 | -0.65 (.258) | -0.59 (.278) |
| Information on major industry trends | 4.6875 | 5.5714 | -2.38 (.010) | -2.10 (.017) |
| Number and types of employees | 4.3125 | 5.3143 | -2.49 (.007) | -2.15 (.016) |
| Measures of the physical level of output and capacity utilization | 5.9688 | 5.9429 | 0.08 (.468) | -0.19 (.425) |
| Statement of accounting principles used in the preparation of the accounts (e.g., compliance with statements of standard accounting practice, changes in accounting methods) | 4.5000 | 5.3143 | -1.92 (.029) | -1.98 (.024) |
| Names and salaries of senior management | 3.1875 | 4.8286 | -3.73 (.000) | -4.47 (.000) |
| Terms of share option plans and the number of shares involved | 2.2813 | 4.1714 | -4.31 (.000) | -3.66 (.000) |
| Explanation of the calculation of the earnings per share | 3.5000 | 4.3429 | -1.95 (.028) | -1.75 (.040) |
| Indication of employee morale (i.e., labor turnover, strikes, absenteeism) | 4.3871 | 4.7429 | -0.77 (.221) | -0.69 (.245) |
| Brief narrative history of the company | 4.6774 | 5.1429 | -1.21 (.115) | -1.23 (.109) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample | | t- statistic | Wilcoxon (z-statistic) |
|---|--------|----------|--|---------------------------|
| | Local | National | (Two-tailed significance) (Sig.) | (Sig.) |
| Disclosure of recent legal proceedings, such as bankruptcy or criminal convictions, that pertain to the directors or principal executives, as well as family relationships between executives and directors | 4.5938 | 5.2000 | -1.48 (.072) | -1.24 (.108) |
| Statement of company objectives | 4.8125 | 5.4000 | -1.49 (.071) | -1.60 (.055) |
| A listing of the names of all common stockholders who own more than 10% of the company's stock at the end of the year | 3.9063 | 4.1143 | -0.47 (.320) | -0.44 (.330) |
| Number and type of ordinary shareholders (e.g., institutions, individuals) | 4.0323 | 4.2286 | -0.42 (.386) | -0.38 (.350) |
| Disclosure of the responsibilities, experience, and background of corporate executives and other key personnel such as research scientists and production managers | 5.3226 | 5.0882 | 0.54 (.292) | -0.16 (.435) |
| Discussion of the progress of any recent acquisitions | 4.3438 | 4.4571 | -0.30 (.383) | -0.24 (.406) |
| Description of major products produced | 5.5625 | 6.0571 | -1.52 (.067) | -1.19 (.117) |
| Names of company directors | 5.1250 | 5.3143 | -0.45 (.328) | -0.80 (.211) |
| Information on corporate social responsibility (i.e., attitude of company, expenditures) | 3.8750 | 3.8286 | 0.12 (.454) | -0.27 (.394) |
| The principal business or professional affiliation of each outside director | 4.4375 | 4.4857 | -0.13 (.450) | -0.18 (.428) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample | | t- statistic | Wilcoxon (z-statistic) |
|---|--------|----------|--|---------------------------|
| | Local | National | (Two-tailed significance) (Sig.) | (Sig.) |
| Specific disclosure (plaintiff, description of charges, dollar amount, status) of each lawsuit brought against the company during the year from whatever source, if the damage claim amounts to 10% or more of current assets | 5.2813 | 5.8571 | -1.71 (.045) | -1.99 (.023) |
| Disclosure of any lawsuits or disciplinary actions directed at the company's outside law firm or CPA auditor during the year, including the nature of the charges and the outcome | 3.9375 | 4.4118 | -1.03 (.154) | -1.09 (.138) |
| Information relating to research and development (e.g., progress with new product development, planned expenditures) | 3.9032 | 4.4000 | -1.33 (.094) | -1.31 (.095) |
| Money value of the firm's order backlog | 4.9032 | 5.2571 | -0.93 (.178) | -0.93 (.177) |
| If the company changed its CPA auditor during the year, disclosure of its basis for the termination and whether or not the auditor agrees with the company's statement | 4.0313 | 4.2286 | -0.43 (.334) | -0.62 (.266) |
| Description of marketing network for finished goods/services | 4.7813 | 5.0000 | -0.57 (.286) | -0.69 (.244) |
| Description of major plants, warehouses, and properties, including location, function, and size | 5.4375 | 5.7143 | -0.78 (.219) | -0.82 (.205) |
| Information about products subject to price controls | 4.8750 | 5.0571 | -0.49 (.311) | -0.59 (.279) |

Exhibit 2. Information Item Importance Ratings and Tests for Intergroup Difference (continued)

| Item | Sample Local National | | t- statistic | Wilcoxon (z-statistic) |
|---|-----------------------------|--------|--|---------------------------|
| | | | (Two-tailed significance) (Sig.) | (Sig.) |
| Breakdown of earnings by major product lines, customer classes, and geographical location | 3.9375 | 4.4286 | -1.12 (.134) | -1.04 (.149) |
| Discussion of the company's results for the past year | 5.3438 | 5.7714 | -1.17 (.123) | -1.45 (.073) |
| Information relating to post balance sheet events | 4.3125 | 5.1714 | -2.33 (.011) | -2.22 (.013) |

the Pearson correlation coefficient ($r = 0.86$, $p < 0.001$), and the Spearman rank correlation ($s = 0.87$, $p < 0.001$).⁴¹

Although the two samples rate the *relative* importance of each item similarly, the *absolute* importance rating assigned to each item is, almost without exception, lower for the "local" sample. The last two columns of Exhibit 2 report significance tests of this intergroup difference. Both the parametric t-test and the nonparametric Wilcoxon Rank Sum test were used, the latter to allow for non-normal distributions and to control for the impact of outliers. The results are almost identical between the two tests. Twenty-seven of the eighty-nine t-statistics are significant at the .05 (two-tailed) level. Of these, seven are for the F-A items (Panel A), nine relate to F-NA items (Panel B), and the remaining eleven are for the NF-NA items (Panel C). The Wilcoxon test also finds twenty-seven significant differences, of which only three differ from the t-test. In all cases where a significant difference is found, the "national" sample has the higher mean importance rating.

That lower importance ratings were assigned to information supplied by small CPA firm clients is insufficient to address the effects of audit firm size. Even for the nonfinancial items (in which external audits tend to play only a limited role), eleven of thirty-nine items are rated significantly more important by the "national" sample, and the remaining importance ratings are invariably lower

⁴¹ These correlations were computed between the "national" and "local" column figures in Exhibit 2. We also calculated these correlations separately for each panel, with similarly significant results.

for the "local" sample. This finding is consistent with the respondents' association of client size with CPA firm size, attributing to the clients of the local audit firm typical characteristics of smaller business firms (e.g., higher risk and less formal accounting and control systems). To control for this potential confounding, we limited our test to the fifty financial disclosure items (where external audits tend to play a major role). Further, we standardized each respondent's importance ratings for the F-A items as follows:

1. For each respondent, we computed the arithmetic mean importance rating for the F-A and F-NA items, respectively.
2. Each respondent's mean rating for the F-A items was divided by his or her mean rating for the F-NA items.

By using each respondent's mean F-NA rating as the control, the standardized score helps to abstract from the effects of attributed client (as opposed to CPA firm) size.

If larger audit firms are perceived to provide higher quality audits, the standardized F-A rating should be higher for the "national" sample. This directional difference is observed: the "national" sample's mean standardized F-A rating is 1.006, while that for the "local" sample is 0.97. Using a *t*-test, this between-sample difference is marginally significant ($t = 1.41$, $p < .08$ [one-tailed]). The Wilcoxon test result is more significant ($Z = 1.91$, $p < .03$ [one-tailed]). These results provide moderate support for the contention that perceived audit quality increases with audit firm size. To the extent that loan officers' perception of audit quality is positively related to actual quality, the proposition that larger audit firms provide higher audit quality is also moderately supported.

SUMMARY AND CONCLUSIONS

This study has provided some empirical support for the contention that audit quality increases with audit firm size. If replicated in future studies, this finding would indicate that audit firm size, *per se*, is insufficient reason for accounting regulators to be concerned with audit quality.

Since the issue of audit firm size and, more broadly, competition in the auditing industry continues to be a matter of public concern, further evidence on the topic would be beneficial. We note several promising avenues for such future research. First, it is important to recognize that every research approach has its strengths and weaknesses. Obtaining reliable results requires the application of

multiple methodologies. In measuring the dependent variable, audit quality, this study has used an indirect approach, focusing on respondents' perceptions of audit quality. An alternate approach is to examine action effects. This would involve constructing cases, such as information sets associated with different sized audit firms, and asking subjects to make economic decisions (e.g., setting interest rates, loan sizes, or making security investment choices). Libby and Johnson, Pany, and White have used this approach to study the effects of audit reports.⁴² In constructing such cases, external validity would be enhanced by including mixes of disclosure items, as opposed to this study's treating each item independently. Another desirable extension would be to include other major users of financial reports, such as union negotiators, investors, financial analysts, and regulators.

Beyond studying the perceptions and actions of individuals, insights are available from examining the aggregate effects of audited financial disclosure. Fried and Schiff have studied security price reactions to auditor switches, and Smith and Nichols have examined stock price reactions to auditor switches associated with accounting disagreements.⁴³ Both studies suffer from very small sample sizes. Also, neither was concerned with the effects of audit firm size, per se. Replications of these studies with larger samples could further explain the effects of audit firm size and other factors hypothesized to affect audit quality.⁴⁴

Another goal of this study was to facilitate further studies of the Mexican accounting environment. An overview of current Mexican accounting institutions and practice was provided. A notable finding in our search of the extant literature was the paucity of systematic studies on the topic. Collecting such evidence not only will improve our understanding of the Mexican accounting environment but will also aid the analysis of accounting institutions and practices in other settings.

⁴² R. Libby, "The Impact of Uncertainty Reporting on the Loan Decision," *Journal of Accounting Research* (Supplement 1979), 35-37; and D. Johnson, K. Pany, and R. White, "Audit Reports and the Loan Decision: Actions and Perceptions," *Auditing: A Journal of Practice and Theory* (Spring 1983), 38-51.

⁴³ D. Fried and M. Schiff, "CPA Switches and Associated Market Reactions," *Accounting Review* (April 1981), 326-41; and D. Smith and D. Nichols, "A Market Test of Investor Reaction to Disagreements," *Journal of Accounting and Economics* (June 1982), 109-20.

⁴⁴ Chow tested security market reactions to earnings certified by different auditors. He found no significant auditor effect.

**APPENDIX A. NATIONAL SECURITIES COMMISSION DISCLOSURE
REQUIREMENTS SET FORTH BY THE CIRCULARS ISSUED BY THE
COMMISSION**

(Issued February 25, 1980)

Circular 11-2, "Financial, Legal, Accounting and Administrative Information"

- (i) Annual Reports and documentation
 - A. Balance Sheet
 - B. Holding Companies
 - C. Publication of Financial Statements for External Users
 - D. Investment in Stocks, Bonds and Other Securities
 - E. Fixed Assets of the Corporation
 - F. Bond Issues
 - G. Production
 - H. Labor Issues
 - I. Expansion Programs
 - J. Documents and Resolutions of the Last Ordinary Annual Meeting of Stockholders
- (ii) Information with respect to changes in accounting ledgers, financial structure, or profits and losses of the corporation, as well as the performance of the securities it has issued
- (iii) Information on actions or events that affect the corporation
 - A. Encumbrances on Assets
 - B. Equity Participation in Other Companies
 - C. Loss of a Portion of Its Capital Stock
 - D. Bankruptcy or Suspension of Payments
 - E. Strike Action against the Corporation
 - F. Loan Agreements
 - G. Other Events
- (iv) Quarterly information
 - A. Balance Sheet
 - B. Profit and Loss Statement
 - C. Financial Ratios
 - D. Capital Stock
- (v) Complementary quarterly information
 - A. Current Assets
 - B. Foreign Currency Liabilities
 - C. Other Accounts Receivable and Documents for Collection
 - D. Difficult or Doubtful Accounts
 - E. Inventories
 - F. Obsolete and Defective Items in Inventory
 - G. Property, Plant, and Equipment
 - H. Rented Machinery and Equipment
 - I. Investment in Subsidiaries and Affiliates
 - J. Other Assets
 - K. Construction in Process
 - L. Discounted Documents and Invoices Assigned
 - M. Contingent Liabilities

- N. Other Expenses and Revenues
- O. Net Worth
- P. Financial Guarantees or Limitations Caused by the Issue of Securities
- Q. Bond Issue
- (vi) General provisions
 - A. Responsibility of managers or officers who sign the documentation filed
 - B. Signature of the auditors on financial statements
 - C. Simultaneous notice to the public, the National Securities Commission, and the Mexican Stock Exchange.

(Issued May 22, 1980)

Circular 11-3, "Indication of the Effects of Inflation in Corporate Financial Information"

The most relevant provisions of Circular 11-3 are the following:

1. The obligation to use a method which makes specific costs relating to fixed assets current in the restatement of financial information;
2. Compliance with specific standards relating to the statement of investments in equity held by the corporation, in accordance with its percentage of equity participation in each company;
3. With respect to net worth, the increased value of fixed assets due to a reappraisal may be capitalized only to a maximum of 50 percent in the fiscal year in which the appraisal is carried out, and up to a maximum of 6.25 percent annually in subsequent years.

(Issued June 15, 1981)

Circular 11-4, "Legal Information Which the Corporation Must Provide"

Shareholders' meetings

Minute books and registers

Stock certificates

Agreements

Holding companies

Changes in management control

Corporations issuing registered mortgage bonds

Responsibility of directors or officers who sign documents

Notice of amendments to the bylaws.

APPENDIX B. STATEMENTS ON MEXICAN ACCOUNTING PRINCIPLES

SERIES A

- A1. Basic Financial Accounting Theory
- A2. Economic Entities
- A3. Realization and Accounting Period
- A5. Disclosure in the Financial Statements
- A7. Consistency

SERIES B

- B4. Statement of Changes in Financial Position (amended by B11)
- B5. Accounting for Transactions in Foreign Currencies (amended by B10)

- B7. Disclosure of the Effects of Inflation on Financial Data (amended by B10)
- B8. Consolidation and Valuation of Permanent Investments
- B10. Disclosure of Inflation Effects on Financial Information
 - a). Accounting for Inflation
 - b). Overall Financing Cost
 - c). Exchange Rates
- B11. Cash Flow Statement

SERIES C

- C1. Cash
- C3. Accounts Receivable
- C4. Inventories
- C6. Property, Plant, and Equipment
- C8. Intangibles
- C9. Liabilities
- C11. Stockholders' Equity
- C12. Contingencies and Commitments

SERIES D

- D3. Accounting for Personnel Costs
-

The Market for Audit Services in India: An Empirical Examination

DANIEL T. SIMON, RAMACHANDRAN RAMANAN,
and AMITABH DUGAR*

Recent papers have examined the determinants of audit fees and the structure of the market for audit services in several countries. A majority of these studies have focused on the U.S. audit services market (e.g., Simunic, Simon, Maher et al., Palmrose, and Francis and Simon.¹ Several other countries have also been studied: Australia,² the United Kingdom,³ and New Zealand.⁴ Bavishi and

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¹ D. Simunic, "The Pricing of Audit Services: Theory and Evidence," *Journal of Accounting Research* (Spring 1980), 161-90, and "Auditing, Consulting, and Auditor Independence," *Journal of Accounting Research* (Autumn 1984), 679-702; D. Simon, "The Audit Services Market: Additional Empirical Evidence," *Auditing: A Journal of Practice and Theory* (Fall 1985), 71-78; M. Maher et al., "Pricing of Audit Services: Additional Evidence" (Working paper, University of Michigan, 1985) and "Audit Fees and the Code of Professional Ethics" (Working paper, University of Chicago, 1986); Z. Palmrose, "Audit Fees and Auditor Size: Further Evidence," *Journal of Accounting Research* (Spring 1986), 97-110; and J. Francis and D. Simon, "A Test of Audit Pricing in the Small-Client Segment of the U.S. Audit Market," *Accounting Review* (January 1987).

² J. Francis, "The Effect of Audit Firm Size on Audit Prices," *Journal of Accounting and Economics* (August 1984), 133-51; and J. Francis and D. Stokes, "Audit Prices, Product Differentiation and Scale Economies: Further Evidence from the Australian Market," *Journal of Accounting Research* (Autumn 1986).

³ R. Taffler and K. Ramalinggam, "The Determinants of the Audit Fee in the U.K.: An Exploratory Study" (Working paper, City University Business School, London, 1982).

⁴ M. Firth, "An Analysis of Audit Fees and Their Determination," *Auditing: A Journal of Practice and Theory* (Spring 1985), 23-37.

Wyman describe the accounting services market in several countries, although they do not present detailed statistical models of the determinants of audit fees.⁵ Several of these papers are summarized in Francis and Simon.⁶ In general, these studies find audit fees to be an increasing function of variables representing client size, audit risk, and audit complexity. In addition, several of the studies (Taffler and Ramalinggam, Francis, Palmrose, and Francis and Simon)⁷ find that Big Eight auditors of their international affiliates receive higher fees than do other auditors in the United States, the United Kingdom, and Australia. Firth, however, finds no evidence of a Big Eight fee premium in New Zealand.⁸ The existence of a Big Eight fee premium has generally been interpreted as evidence of product differentiation in the audit service market.

The current study attempts to extend the understanding of international similarities and differences in the audit services market by applying the methodology of earlier studies to India, a country not previously studied in detail by audit fee researchers. The basic conclusion of the paper is that the determinants of audit fees in India are similar to those of other countries; that is, audit fees are strongly related to client size, audit risk, and complexity variables. Another important finding is the existence of a premium fee paid to Big Eight auditors. This result, which is consistent with the results of studies of several other countries, suggests the existence of product differentiation in the market for audit services.

THE INDIAN ACCOUNTING ENVIRONMENT

The institutional structure of the audit services market in India is largely the outcome of the provisions of the Indian Companies Act of 1956.⁹ The Companies Act regulates the corporate form of business activity in India in a manner similar to the Securities Exchange Acts of 1933 and 1934 in the United States. It requires that all corporations (public and private) register with the Registrar

⁵ V. B. Bavishi and H. E. Wyman, *Who Audits the World?* (Storrs, Conn.: University of Connecticut, 1983).

⁶ Francis and Simon, "A Test of Audit Pricing," Table 1.

⁷ Taffler and Ramalinggam, "Determinants of the Audit Fee"; Francis, "Audit Firm Size"; Palmrose, "Audit Fees and Auditor Size"; and Francis and Simon, "A Test of Audit Pricing."

⁸ Firth, "Analysis of Audit Fees."

⁹ This section is based on the Indian Companies Act of 1956 and the coverage of India by Bavishi and Wyman, *Who Audits the World?*; Frederick D. S. Choi and Gerhard G. Mueller, *International Accounting* (Englewood Cliffs, N.J.: Prentice-Hall, 1984); and Adolf J. H. Enthoven, *Accountancy Systems in Third World Countries* (Amsterdam: North Holland, 1977).

of Companies upon formation by filing a Memorandum and Articles of Incorporation. Further, public companies must annually file with the Registrar a copy of their audited financial statements. The audit must be performed by a chartered accountant holding a certificate of practice from the Institute of Chartered Accountants of India (ICAI). Corporate financial statements must make the disclosures prescribed in the Companies Act, and audits must be performed in accordance with the general and industry-specific standards promulgated by the ICAI. As in most other countries, chartered accountants and accounting firms render ancillary services, such as management advisory services, preparation of tax returns, and internal auditing.

The number, size, and fee structure of accounting firms is largely influenced by two institutional practices prevailing in the audit services market: (1) the importance of internal audit and internal control systems and (2) the organizational structure and compensation levels in accounting firms. The Companies Act requires the auditing chartered accountant to report to the shareholders on the adequacy of the internal control system. This places the responsibility for maintaining proper internal control procedures on corporate management. In addition, the act also imposes an internal audit requirement on companies that have stockholders' equity in excess of 2.5 million rupees. Although larger corporations maintain their own internal audit staffs, smaller firms subcontract this function to accounting firms. Although the degree of reliance placed on internal audit reports and internal control systems varies across firms, to suppose that at least some reliance is placed with consequent reduction in audit effort and fees is not unreasonable.

Staff in audit firms can be classified into three levels of expertise and seniority: (1) trainee accountants (article clerks) who are completing the requisite three-year training period prescribed by ICAI to satisfy work experience requirements for the certificate of practice, (2) chartered accountants who have received the certificate of practice but who are employees of the accounting firm rather than being in private practice, and (3) partner-owners of the accounting firm possessing the certificate of practice. Personnel falling into categories (1) and (2) are generally paid fixed salaries irrespective of the number of hours spent in the engagement, with profits being shared by partner-owners. Consequently, audit billings are not made in terms of number of hours spent by each category of accountants as in U.S. firms. Instead, flat fee quotations are made on the basis of size and complexity of

prospective clients' business and estimates of the amount of total audit effort involved.

Firms of chartered accountants in India may be broadly classified into three groups: (1) local firms serving clients in one city or region only — these are small in size and earn most of their revenues from taxation and internal audit services rather than statutory audits; (2) regional firms which have offices at major locations where their clients operate or have formed affiliations with prominent local firms to service client offices in remote geographical areas — these are generally somewhat larger in size; and (3) very large national firms which have offices in most major industrial and commercial centers; among these firms are seven of the Big Eight U.S. accounting firms. Although the line of demarcation between national and other firms is very clear, the distinction between local and regional firms is somewhat nebulous due to lack of complete information on client size, revenues, number of employees, and so forth. This study will, as have most previous ones, focus on possible differences (in terms of fee structure) between two auditor groups: Indian affiliates of Big Eight firms and all other auditors.

METHODOLOGY

Research on audit fees in India is facilitated by the fact that disclosure of audit fees is mandated by the Indian Companies Act. Therefore, most corporate annual reports include the amounts paid to the independent auditors. This avoids the necessity (as in the case of studies of U.S. audit fees) of obtaining data by questionnaires, with the resulting possibility of nonresponse bias. A sample of annual reports for 117 nongovernment-owned Indian firms was collected. These annual reports were used as a source for data on audit fees and all explanatory variables.

Following earlier studies, audit fees are regressed on a set of explanatory variables, all of which have been found to have a positive and significant relationship to audit fees. The basic regression model is as follows:

$$\text{LOGFEE} = b_0 + b_1 \text{LOGASSETS} + b_2 \text{INVREC} + b_3 \text{LOSS} \\ + b_4 \text{SQSUBS} + b_5 \text{OPINION} + b_6 \text{AUDITOR} + u$$

where the dependent variable is the natural logarithm of audit fee and the explanatory variables are the following:

$$\begin{aligned} \text{LOGASSETS} &= \text{natural logarithm of total assets} \\ \text{SQSUBS} &= \text{square root of the number of subsidiaries} \end{aligned}$$

- INVREC = the proportion of assets in inventories and receivables
- LOSS = a dummy variable having a value of 1 if the firm had an operating loss
- OPINION = a dummy variable having a value of 1 if the auditor's report indicated a serious weakness in the firm's internal control system
- AUDITOR = a dummy variable having a value of 1 if the auditor was a Big Eight firm or an Indian affiliate of a Big Eight firm
- u = a residual error term assumed, subject to subsequent testing, to have the standard properties

The first five explanatory variables are related to client size (LOGASSETS), and audit complexity and risk (INVREC, LOSS, SQSUBS, and OPINION). Based on findings of earlier studies, these variables are expected to be positively related to audit fees.¹⁰ The only one which differs from those used in earlier studies is OPINION. In studies of the U.S. audit market, this variable indicates that the firm received a "subject to" audit opinion. For the firms studied here, the variable indicates that the auditor reported that internal control was inadequate. Based on implications of similar studies of the U.S. audit market, we hypothesize that this variable may be positively related to audit fees.¹¹ The sixth explanatory variable, AUDITOR, tests whether Big Eight auditors receive higher than expected audit fees in India, as they appear to do in several other countries. The log fee/log assets form of the regression has been found in previous studies¹² to be well specified in terms of homoscedasticity and normality of the estimated residual errors.

RESULTS

Exhibit 1 presents descriptive statistics of the variables used in the regression model. Average assets are 969.8 million rupees, approximately \$80 million (U.S.). There is significant cross-sectional

¹⁰ See Simunic, "Pricing of Audit Services"; and Francis, "Audit Firm Size" for a discussion of these variables.

¹¹ This variable may be a proxy for expenditures on internal control. If this is the case, prior studies of audit fees yield no unambiguous predictions as to the significance of the coefficient for this variable. Three previous studies have examined whether expenditures on internal auditing reduced external audit fees. Simunic, "Pricing of Audit Services," and Maher et al., "Audit Fees," found no significant association, but W. Wallace, "Internal Auditors Can Cut Outside CPA Costs," *Harvard Business Review* (March-April 1984), 16-17, found that expenditures on internal auditing reduced external audit fees.

¹² Francis, "Audit Firm Size," and Francis and Simon, "Test of Audit Pricing."

Exhibit 1. Descriptive Statistics

| Variable | Mean (standard deviation) |
|---|------------------------------|
| Audit fee (thousands of rupees) | 102.6 (130.2) |
| Assets (millions of rupees) | 969.8 (1689.4) |
| Subsidiaries | .93 (1.57) |
| Proportion of assets in inventory and receivables | .38 (.21) |
| Percentage of firms | |
| With an operating loss | 21 |
| Receiving a negative auditor's report on the adequacy of inventory control | 15 |
| Audited by | |
| Big Eight firms | 33 |
| Other auditors | 67 |

Exhibit 2. Correlation Matrix of Explanatory Variables

| | LOGASSET | INVREC | SQSUBS | LOSS | OPINION | AUDITOR |
|-----------|----------|--------|--------|------|---------|---------|
| LOGASSETS | 1.00 | | | | | |
| INVREC | -.02 | 1.00 | | | | |
| SQSUBS | -.49 | .10 | 1.00 | | | |
| LOSS | -.27 | -.33 | -.23 | 1.00 | | |
| OPINION | -.10 | -.05 | -.03 | .14 | 1.00 | |
| AUDITOR | .27 | .25 | .12 | -.19 | -.09 | 1.00 |

variation for all variables, which should enable the regression estimation to identify any significance on the explanatory variables if it exists. Exhibit 2 displays the correlation matrix of the explanatory variables. Most of the first-order correlations are moderate, suggesting that multicollinearity is not a serious problem. An exception may be the high (.49) correlation between LOGASSETS and SQSUBS, which may make it difficult to assess the separate effects of these variables on audit fees.

Exhibit 3 reports the results of the OLS regression. A good linear fit is indicated by the value of R^2 (.83) and the overall F statistic. Tests on the residual error terms indicate that the regression equation is well specified.¹³ Two of the client size and audit

¹³ A Goldfield-Quandt test for nonconstant variance of the estimated residual

Exhibit 3. Regression Results

| Variable | Coefficients (t-statistics) |
|-------------------------|--------------------------------|
| LOGASSETS | .52 (14.57)† |
| INVREC | 1.04 (4.51)† |
| SQSUBS | .14 (2.16)* |
| LOSS | -.15 (1.25) |
| OPINION | .02 (.16) |
| AUDITOR | .71 (7.01)† |
| INTERCEPT | .26 |
| Adjusted R ² | .83 |
| F-Statistic | 94.8† |

* Significant at the .05 level.

† Significant at the .01 level.

complexity variables, LOGASSETS and INVREC, are significant at the .01 level. The variable for subsidiaries is significant at the .05 level. The variables representing operating loss and auditor opinion on internal control were not significant.

The auditor variable was significant at better than the .01 level, indicating that Big Eight firms receive higher audit fees than do other firms. This finding agrees with the results of studies of the United States, the United Kingdom, and Australia and differs from the findings for New Zealand.¹⁴

error terms yielded an insignificant F-statistic, indicating that the assumption of homoscedastic residuals was not violated. A Chi-square test failed to reject the assumption that the residuals were normally distributed. See S. Goldfield and R. Quandt, "Some Tests for Homoscedasticity," *Journal of the American Statistical Association* (June 1985), 539-47.

¹⁴ Firth notes that in New Zealand, the use of the international names of accounting firms was allowed only after 1983. This may indicate less "brand-name" recognition and thus partially explain the lack of evidence of product differentiation (higher prices) in New Zealand. India has no prohibition of the use of the name of the international affiliate, although only two firms, Price Waterhouse and Arthur Andersen, regularly sign their own names to audit reports. See Firth, "Analysis of Audit Fees."

FURTHER TESTS

Some additional tests were conducted to confirm that the existence of a Big Eight fee premium was not due to model misspecification or other data problems. To ensure that a subset of Big Eight firms was not responsible for the significance of the AUDITOR variable, the regression was run with a separate dummy variable for each Big Eight firm. All of these dummies were significant at the .05 level, indicating that the Big Eight fee premium is a general phenomenon.

Another possible problem is model misspecification. In particular, client size could be a confounding variable since Big Eight clients are likely to be larger than other auditees. In this sample, average assets of Big Eight clients was 1,348 million rupees versus 781 million for other clients. This is not necessarily a problem since (1) the difference was not significant at the .05 level and (2) size as measured by assets was controlled for in the regression model. Nonetheless, to be certain that client size was not driving the results, the regression was run on a subsample which eliminated any size differences between Big Eight and non-Big Eight clients. Firms having a Big Eight auditor were matched with firms of comparable size with non-Big Eight auditors, with a size match of within 10 percent of total assets. This procedure resulted in a subsample of sixty-two firms (thirty-one matches), which were virtually indistinguishable in terms of size as measured by assets. Mean assets (standard deviation) were 1,292 (2,047) million for firms with Big Eight auditors and 1,293 (2,061) million for firms with non-Big Eight auditors. The regression results for this subsample were consistent with those reported earlier, and the AUDITOR variable remained significant at better than the .01 level ($t = 6.85$). Thus, it does not appear that model misspecification is responsible for the significance of the variable representing a Big Eight auditor.

SUMMARY AND CONCLUSIONS

This paper extends previous research on the auditing services market to India, a country not studied in detail by previous work. The results indicate a broad similarity between the audit services market in India and in other countries. Client size and some audit risk/audit complexity variables were found to be significantly associated with audit fees. In addition, auditor type was found to be a highly significant factor in audit fees: Big Eight auditors and their Indian affiliates received premium fees after controlling for

other variables. This result is consistent with the interpretation given in other studies which have found a Big Eight fee premium;¹⁵ there appears to be product differentiation in the market for audit services. Big Eight firms receive higher audit fees than other firms, apparently due to actual or perceived higher audit quality.

The results obtained here, in conjunction with other studies, suggest considerable similarity in the economics of auditing across several different countries. Audit fees are a function of size, complexity, and risk variables. Moreover, in many countries, product differentiation appears to exist in the audit services market, with large international accounting firms receiving premium audit fees.

¹⁵ Francis, "Audit Firm Size"; and Francis and Simon, "Test of Audit Pricing."

Accounting History's Claim to Legitimacy

ANTHONY G. HOPWOOD and H. THOMAS JOHNSON*

Recently an article appeared in this journal by Roger Lister entitled "Accounting as History."¹ In that article, Lister challenges "accounting history's claim to be a subject for serious academic study," (54). Given the breadth and significance of his conclusion, a careful examination is imperative to dispel seemingly misleading arguments. Not only can Lister's criteria as to what constitutes sound historical investigation be debated, but also his analysis of accounting history as such seems profoundly flawed. Lister's insights into attempts to understand the nature of, or reasons underlying, various accounting practices observed from the fifteenth century to the present seems inadequate.

ON HISTORY

Lister argues that any "study of the past" must meet two criteria to "justify itself to be worthy of the name 'history' " (49). Sound history must select and arrange historical facts "toward the analysis of [an important] theme" (51). It must also provide generalizations (i.e., "useful lessons from the past") by analyzing "facts within themes in terms of their causal fertility" (68). Lister regards historical writing which offers facts without an important theme as mere antiquarianism; he defines a theme's *importance* "in terms of its influence on the development of society" (51). Interestingly,

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¹ Roger J. Lister, "Accounting as History," *International Journal of Accounting* (Fall 1984), 49-68. Page number references to Lister's article appear in parentheses.

this definition is itself not independent of concepts of historical causality. If historical writing does not analyze facts within a theme according to general causal relationships, it is seen to lack scientific objectivity. Sound historical writing, according to Lister, must join important themes with clearly formulated causal relations "between fact and interpretation . . . and between past, present, and future" (52).

Lister judges accounting history unworthy of its inclusion in the area of "history" because, in his view, it fails to encompass a theme that has a significant influence on society, and its development lacks a systematic pattern. Being devoid of social importance, accounting cannot provide an important theme for selecting and arranging historical accounting facts. Furthermore, the absence of a systematic pattern in accounting's development precludes drawing lessons from accounting's past. Accounting history, then, can be nothing more than subjective, unscientific antiquarianism. It is not history, Lister concludes, and it does not deserve scholarly attention.

Such a dogmatic view of the nature of history simply fails to recognize the extensive literature on historiography that Lister cites so partially. The emphases which he chooses to select are still the subject of continuing and intensive discussion among eminent historians and other social scientists,² few of whom would have the insensitivity to terminate the debate in Lister's summary manner. The nature of historical facts is still subject to wide discussion, as are the epistemological status and desirability of the causal generalizations which Lister seeks to impose as a requirement for a legitimate history. Granted some histories are written in this manner; but many others are written with very different emphases and concerns. Indeed, many historians would see themselves as engaged in an activity which makes more problematic commonly accepted concepts of causality. These scholars emphasize instead the interactive nature of human and social processes (both the reflective and constitutive aspects of social and economic life) and the complex configurations which create the preconditions for historical change. Rather than seeking to impose any simple order on the richness and diversity of human existence, as Lister evidently does, many historians would emphasize their primary aim as being that of taking temporal sequences seriously when attempting to

² For reviews see, for instance, J. Steinberg, " 'Real Authentick History,' or What Philosophers of History Can Teach Us," *Historical Journal* (1981), 453-74; and T. Skocpol, ed., *Vision and Method in Historical Sociology* (Cambridge: Cambridge University Press, 1984).

understand the emergence of outcomes and events. They strive to ask questions of social structures and processes when they are understood to be situated concretely in time and space. They are interested in uncovering and understanding the mechanisms of historical change rather than accounting for it in terms of broad tendencies abstracted from any specific context. Aiming to appreciate both the particular and varying features of specific kinds of social and economic structures and patterns of change, most historical analyses do not attempt sweeping generalizations but rather offer more cautious interpretations of the interplay between meaningful actions and their structural contexts. This is done to increase our insights into "the unfolding of unintended as well as intended outcomes in individual lives and social transformations."³

Modest as such aims may be, they stand in stark contrast to the profoundly ahistorical nature of Lister's own analysis. Imposing a pre-given, but unaccounted for, idea of the real functions of accounting on the historical record, Lister not surprisingly finds history to be of little relevance to his own highly specific interests. He is not concerned with the historical processes through which particular conceptions of the functionality of accounting emerged. He pays no attention to the historical interplay between the technical practices of an operational economic calculus, such as accounting, and the emergence of economic categories and modes of economic discourse. To Lister, profit, capital, and other distinctions of modern accounting and economic theorizing are seemingly self-evident. Rather than wanting to problematize their patterns of development and investigate the issues and institutional contexts in which they arose, Lister endows them with a privileged epistemological status of the type that is not uncommon in ahistorical and institutionally detached modes of economic theorizing. Moreover, from this privileged position of insight, he reads the history of accounting for signs of the realization (or more appropriately in Lister's analysis, the frustration) of the pre-given functional imperatives. He imposes on the historical record a view of a pre-given accounting essence of a type that increasingly is being questioned in serious historical inquiry.⁴

The implications of Lister's ahistorical and epistemologically

³ Skocpol, *Vision and Method*.

⁴ For more insight into the imperatives that scholars use to interpret accounting, see Anthony G. Hopwood, "On Trying to Study Accounting in the Contexts in Which it Operates," *Accounting, Organizations, and Society*, vol. 8, no. 2/3 (1983), 287-305; and S. Burchell et al., "The Roles of Accounting in Organizations and Society," *Accounting, Organizations, and Society*, vol. 5, no. 1 (1980) 5-27.

privileged analysis pepper his discussion of the craft of history and its accounting potential. Enterprises and the agents engaged in them are defined prior to and independently of the specific practices in which they are engaged. Modern practices and the rationales for them are used as bases for interrogating the historical record. Limited views of human agency and self-reflection are evident throughout the discussion. Inadequately conceptualized concepts of lag are used to explore the complex interdependencies between enterprises and the contexts in which they operate. Very particular views of historical development and progress are used to evaluate the trajectories of accounting change. A history of failure and inadequacy arises from the imposition of an ahistorical concept of accounting essence.

Lister's conception of history is an inadequate one. While not seeking to defend the accounting history studies that have been done, we are content that many of them have not followed the path that Lister outlined for them. In addition, we hope that the histories of the future will learn from the errors that are so evident in his aspirations for them.

ON ACCOUNTING

Although it prompts interesting speculation as to the nature of history in general and accounting history in particular, Lister's argument seems to be without other merit. While Ben Johnson may have chided Shakespeare for his "small Latin and less Greek," certainly Shakespeare did know a great deal of Latin. Lister apparently does not have a familiarity with accounting practices of past periods. His judgment of accounting's value to society in the past is often based on the erroneous assumption that accounting's purpose in all periods is defined by twentieth century conceptions of the role of accounting. Moreover, by relying excessively on dated secondary sources, he ignores a great deal of recent work in accounting history that contradicts his conclusions.⁵ A few examples illustrate the limitations of his treatment of accounting history.

After examining accounting's social influence before and after the Industrial Revolution, Lister concludes "that through to modern times, both internal and external financial reporting has offered

⁵ Most of the literature on accounting history that Lister cites either documents or surveys research completed before the early 1970s. He derives his definition of accounting history from the American Accounting Association's 1970 "Report of the Committee on Accounting History."

little to its users in the way of meaningful, reliable economic information for decision purposes" (62–63). His chief criterion for judging accounting's usefulness is its "economic informativeness" (59). His standard of "informativeness" is that accounting must report "meaningful, reliable economic information for decision purposes" (62–63). By judging accountancy throughout history in terms of "economic decision usefulness" (the standard by which some of today's accountants judge financial and managerial accounting), Lister betrays a crucial ignorance of the different purposes served at various times by bookkeeping, managerial accounting, and financial reporting.⁶

Bookkeeping before the nineteenth century, for instance, served quite a useful purpose without ever having to provide economic calculations regarding costliness and surplus. Although the purpose of keeping books according to the double-entry system is open to debate, accounting historians, most notably Basil Yamey, caution us against reading modern economic conceptions of profit and capital into pre-nineteenth century uses of double entry. Not only were such modern concepts of the organizational economy still emergent,⁷ but also the institutions of the marketplace themselves provided information adequate for the needs of the time. Virtually all economic activity in that earlier era was controlled either by market transactions or by administrative fiat, which meant that prices and rules provided people the information they needed to make rational economic decisions.⁸ Account books were not an

⁶ Lister's apparent indifference to the economic role of control and his preoccupation instead with decision information is itself of some interest, particularly given the recent growth in research on this topic in the economics of organization (see, e.g., Oliver E. Williamson, *Markets and Hierarchies* [New York: The Free Press, 1975]; Michael C. Jensen and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* [October 1976], 305–60; Stanley Baiman, "Agency Research in Managerial Accounting: A Survey," *Journal of Accounting Literature* [Spring 1982], 154–213; Michael C. Jensen, "Organization Theory and Methodology," *Accounting Review* [April 1983], 319–39). His stance on control limits his historical perspective; it encourages him to ignore the role that economic calculation, including accounting, played in the functioning and development of the pre-modern state. This role could have been an influential institutional locus for development and one which at least in continental Europe was subsequently to result in significant changes in both the pervasiveness and procedures of accounting (see K. Hoskin and R. Macve, "Accounting and the Examination: A Genealogy of Disciplinary Power," *Accounting, Organizations, and Society*, vol. 11, no. 2 [1986], 105–36).

⁷ K. Tribe, *Land, Labour and Economic Discourse* (London: Routledge and Kegan Paul, 1978).

⁸ For more on the distinctions among accounting, rules, and prices, see H. Thomas Johnson, "Accounting, Rules and Organizations: Toward A Sociology of Price," *Accounting, Organizations, and Society*, vol. 11, no. 4/5 (1986), 341–44.

important source of information for economic decision making. They were kept primarily to prod the memory, as evidence to support claims in court, and sometimes as a way to handle negative numbers in that arithmetically unsophisticated era.

Bookkeeping develops into management accounting, charged with the task of providing information for economic decision making and control, when people begin to conduct transactions "internally," without the benefit of market prices or external rules to guide their decisions.⁹ An early (perhaps the earliest) example of internally managed economic activity is the early textile factory. There we find the rudimentary development of cost accounting in the United Kingdom in the late 1700s and in the United States in the early 1800s. This early development of cost accounting and the subsequent development of management accounting in the nineteenth and the early twentieth centuries are stories that Lister completely overlooks, perhaps because accounting historians have told them only in recent years. Indeed, a large body of literature appearing since the early 1970s has substantially altered the picture of nineteenth century management accounting that was drawn by A. C. Littleton and Sidney Pollard, scholars whose works heavily influenced the main sources on which Lister relies for his understanding of accounting history in the industrial era.¹⁰

This recent historical scholarship refutes Lister's claims that nineteenth and twentieth century accounting systems "remained surprisingly primitive" and "had little influence on business decisions" (60). The rudimentary state of equity capital markets precluded, of course, the need for sophisticated public financial reporting before World War I. That does not gainsay, however, the much earlier development of very sophisticated managerial accounting systems. Indeed, nineteenth century accountants responded quickly to internally articulated needs for financial infor-

⁹ The historical significance of the distinction between bookkeeping and accounting in markets and hierarchies is discussed by H. Thomas Johnson in both "The Search for Gain in Markets and Firms: A Review of the Historical Emergence of Management Accounting Systems," *Accounting, Organizations, and Society*, vol. 8, no. 2/3 (1983), 139-46 and *The Role of Accounting History in the Education of Prospective Accountants* (Glasgow: University of Glasgow, Department of Accountancy, 1984).

¹⁰ A partial list of contributors to this literature includes Richard P. Brief, H. Thomas Johnson, Robert R. Locke, Amos J. Loveday, Michael J. Mephram, David M. Porter, Willard E. Stone, and Murray C. Wells. Bibliographic references to their works are supplied by Johnson in both *The Role of Accounting History* and "The Organizational Awakening in Management Accounting History," in *Research and Current Issues in Management Accounting*, ed. Michael Bromwich and Anthony G. Hopwood (London: Pitman, 1986).

mation. But they responded quite differently in the United States than they did in the United Kingdom. In the United States, the development of accounting was importantly influenced by the rise of large vertically integrated firms in which managers could not rely on market prices and external rules to guide economic decision making. American managers devised accounting procedures to rationalize their internal decision processes; in short, they used accounting to make the invisible visible. In the British economy, on the other hand, large firms tended to be vertically specialized, at least after the mid-1800s. Managers of such firms seldom faced any exchanges of resources that were not priced by the market. These managers could rationalize their decisions in terms of a market calculus; they had no reason to devise elaborate accounting systems with which to synthesize price information.¹¹

As has already been stated, underlying all of Lister's attempts to deny that accounting has an important influence on society is the imposition on the historical record of a modern conception of accounting's role. While today's most common definitions of accounting emphasize the production of useful information for decision making, not only should the historical contingency of such a perspective itself be recognized, but almost all historians would also warn Lister of the dangers which such forms of contemporary analysis hold for the interpretation of historical patterns of change. Even in Lister's own terms, however, it can be recognized that a demand for useful information to make economic decisions does not always require elaborate accounting systems. In an era when market channels and governmental controls direct the flow of most economic activity, people can survive quite well with no interpretative and summarizing accountings even though extensive (and often complex) trading activities provide ample reason to keep books. In such instances, the prices prevailing in the marketplace, be they established by competitive or administrative pressures, can provide adequate information for what Lister conceives of as economic decision making. Only when people manage significant amounts of economic activity in hierarchical organizations, subject

¹¹ Differences in the historical development of management accounting between the United States and the United Kingdom are discussed briefly in Johnson, *The Role of Accounting History*. On the influence that international transaction cost differences had on the development of large-scale enterprise, see William Lazonick, "Industrial Organization and Technological Change: The Decline of the British Cotton Industry," *Business History Review* (Summer 1983), 195-236 and the chapter by L. Hannah in *Managerial Hierarchies: Comparative Perspectives on the Rise of the Modern Industrial Enterprise*, ed. Alfred D. Chandler and Herman Daems (Cambridge: Harvard University Press, 1980).

to internal coordination problems and conflicting internal as well as external interests, does one expect to find accounting used in a more analytical and pro-active manner.¹²

ON HISTORICAL INTERPRETATION

Lister further argues that to be a respectable academic pursuit, accounting history must do more than just deal with "important themes"; it must also infer causal relationships that provide the present with useful lessons from the past. This part of his argument is less clearly articulated than the part in which he discusses accounting's presumed lack of "importance." However, although he does not say exactly what he means by the "causal fertility" that provides "useful lessons" from the past, as was noted before, Lister's historical insights in this area are very particular and much contested ones.

The same applies to his argument that "the standing of a subject's history" depends on how conscious the subject's participants are "of the theoretical importance of what they [are] doing" (65). Lister seems to rank accounting history's standing according to how well present accounting theory is explained by (or explains) past developments in theory. To discover whether "the current state of thought in accounting theory suggests any intellectually rewarding avenues in the field of accounting history" (65), he turns to the American Accounting Association's 1977 monograph on accounting theory acceptance.¹³ Finding evidence in that monograph that modern accounting thought is marked by "competing paradigms" and "the lack of a settled underlying foundation" (66), he concludes that modern theory can do little to inform our understanding of the past. Moreover, he says that the "primitive and ill-documented" state of past accounting practice in terms of any of today's competing theoretical paradigms renders the past useless as an aid to understanding the present (67).

Lister's intentions in this part of his argument are far from clear. He seemingly ignores the contention that exists in all of the human and social sciences — and the positive roles that some see this as serving. And if economics, as one such discipline subject to competing paradigms, is a useful model, there would appear to be evidence that a subject's (such as history's) participants' conscious-

¹² Johnson, "The Search for Gain in Markets and Firms"; John W. Meyer, "Social Environments and Organizational Accounting," *Accounting, Organizations, and Society*, vol. 11, no. 4/5 (1986), 345-56.

¹³ American Accounting Association, *Statement on Accounting Theory and Theory Acceptance* (Sarasota, Fla.: AAA, 1977).

ness "of the theoretical importance of what they [are] doing" has little relationship to "the standing of a subject's history." Developed as the self-consciousness of that subject's importance and its internal theoretical history may be, the significance of the issues at stake in a wider intellectual, social, and even economic history remains to be fully recognized and explored. Equally problematic are his views on the role of historical inquiry in understanding paradigmatic debates. Although we agree that the present historical documentation is a constraining factor, we nevertheless wish to emphasize the potential for careful historical inquiry to provide insights into the economic, social, and institutional preconditions of accounting theorizing and the issues other than ignorance which might be at stake in the substantive disagreements which characterize the area. Furthermore, Lister's comments on "lessons from the past" seem to betray the belief that unless a subject's past progresses toward the present according to a continuous evolution, that subject's history is not intellectually rewarding. That belief is held, of course, by scholars who study history to *judge the past in terms of the present*, as Lister seems to argue we should do. Many accounting historians writing before the late 1960s adopted that view when they evaluated pre-twentieth century accounting artifacts in terms of twentieth century financial accounting categories. Their concern was to trace "origins" on the assumption that the past "evolves" into the present in a logical, ordered fashion.¹⁴ Lister observes in the works of these historians that past accounting seldom reflected modern preoccupations, and he concludes that the study of accounting's history is, therefore, useless.

Such a conclusion would be an alien one for someone who studies the past to understand what we do and what we think, not how we arrived, in the present. One can understand accounting better today by observing how people in the past coped with problems that give rise to the need for accounting. In that case, however, one is studying the past *on its own terms*, for what it was *in its own right*. He or she will, of course, select or assemble past facts according to today's general principles but not before making every effort to understand the era from which the facts emanate. A past episode is what it was. It is absurd to say that the study of accounting's history is useless because the past did not concern itself with issues that we find important (or confusing) today. The

¹⁴ Characterized as "accounting Darwinism" by the authors of the AAA's 1977 *Statement on Accounting Theory and Theory Acceptance*, 9, this approach to accounting history is exemplified in the work of A. C. Littleton.

fact that the authors of a 1977 monograph find accounting's intellectual house in a shambles is our problem today; it does not indict the value of studying the past. In fact, the current confusion in accounting theory may indicate that contemporary accountants fail to address questions that really matter. If that is true, a reflective appreciation of the past represents one significant way in which we can attempt to regain our bearings.

CONCLUSION

Lister claims that accounting history is an illegitimate academic pursuit that does not deserve serious attention from scholars. In fact, what he demonstrates is that a particular approach to accounting history is illegitimate. This approach to accounting history views twentieth century financial reporting as the culmination of centuries'-long evolution that began with double-entry bookkeeping. Earlier generations of historians who adopted this approach expended enormous time and energy searching early double-entry records for "antecedents" to modern financial reporting. They tended to label pre-nineteenth century accounts "primitive" when these records do not reflect modern attention to concepts such as cost, profit, and capital maintenance. Turning to more recent accounting artifacts from the nineteenth century, these historians, by not examining the actual records of past companies, completely ignored the development of modern managerial accounting. Lister is quite correct as to the illegitimacy of accounting history if he means the writings of scholars who follow this approach to the subject. But Lister clearly means to indict *all* study of accounting's history, including the quite useful and relevant literature by new accounting historians of the past decade or so of which he seems to be ill informed. Such a judgment, we would claim, is itself an illegitimate one.

Capital Cost Allowance (Depreciation) and Capital Budgeting in Canada

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Since capital budgeting decisions involve the projection of all future cash flows, attempts should be made to assess the impact of the depreciation tax shield on the expected cash flows and any possible recapture, terminal loss,¹ or capital gains resulting from selling a partly depreciated asset.

Although different aspects of the impact of asset depreciation on cash flows have been examined, the scenarios under which a recapture of depreciation, capital gain, or terminal loss may arise have been neglected in the tax treatment of depreciation in capital budgeting analysis. Auerbach and Feldstein, among others, have investigated the effect of inflation on the depreciation of assets.² McDonald and Kiefer, on the other hand, were concerned with the derivation of a capital gains tax rate which is neutral with respect to the sale or retention of assets.³ The optimal tax life that

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¹ The sale of an existing depreciable asset below a book value may result in a terminal loss, not a capital loss. Capital loss arises in the case of selling non-depreciable assets.

² Alan J. Auerbach, "Inflation and the Choice of Asset Life," *Journal of Political Economy* (June 1979), 621-38; and Martin Feldstein, "Adjusting Depreciation in an Inflationary Economy: Indexing Versus Acceleration," *National Tax Journal* (March 1981), 29-43.

³ Stephen L. McDonald, "Depreciability of Assets and the Taxation of Capital Gains," *National Tax Journal* (April 1979), 83-85; and Donald W. Kiefer, "Depreciability of Assets and the Taxation of Capital Gains: A Comment and Extension," *National Tax Journal* (March 1980), 103-6.

will maximize the present value of the expected cash flows of the assets has also been analyzed by Johnson.⁴ This paper attempts to provide insight into the effect of depreciation on capital budgeting analysis by deriving different capital budgeting valuation expressions for the different scenarios allowed by the Canadian tax law⁵ on the disposition of depreciable assets.

To facilitate the estimation of the present value of all the cash flows for capital budgeting decisions, general valuation equations will be derived for calculating the net present value of the cash flows, including the total tax shield of the capital cost allowance from the depreciable asset and the salvage value less any possible recapture of the depreciation upon the selling of the depreciable asset later.

Although in the United States, the straight line, the double declining, and the sum-of-years-digits are alternative methods allowed for tax purposes, in Canada one major method,⁶ a form of declining-balance amortization, is allowed for all depreciable assets. Generally, Canadian tax law provides that depreciable assets be allocated to different categories called classes or pools according to their nature. Different capital-cost allowance (depreciation) rates quoted by the tax law are then applied to the undepreciated assets in the pool each year. New assets bought are added to the pool and old assets sold are subtracted from the pool before calculating the capital cost allowance.

OVERVIEW

One investment decision rule used in capital budgeting is the net present value (NPV) criterion, which indicates that a project should be accepted if its NPV is positive. The NPV of a project is expressed as

$$NPV = -I + \sum_{i=1}^n C^i (1 + k)^{-i} \quad (1)$$

where I is the initial cost of the asset, k is the appropriate discount rate, and C^i is the after-tax cash flow of the project. More specifically, C^i is expressed as

⁴ James M. Johnston, "Optimal Tax Lives of Depreciable Assets," *Financial Management* (Autumn 1979), 27-31.

⁵ The provisions for capital cost allowance and the disposition of depreciable assets are stated in paragraphs 20(1)(a), 12(21)(f), and Regulations 1100 (1)(a), and 1100 (2), (2)(a), (2)(b), and Parts XI and XVII of the Canadian Income Tax Act.

⁶ Only farmers are allowed to use the straight line method of depreciation for tax purposes.

$$C^t = C - \text{taxes} = C - t(C - D) = C(1 - t) + tD \quad (2)$$

where C is the before-tax cash flow net of operating expenses, D is the annual depreciation charges, and t is the corporate tax rate. Equation (2) indicates that the after-tax cash flow consists of two components: the after-tax operating cash flow,⁷ $C(1 - t)$, and the tax shield of depreciation, tD . Thus, the NPV expression can be written as

$$\text{NPV} = -I + \sum_{i=1}^n (1 - t) C_i (1 + k)^{-i} + \sum_{i=1}^n tD_i (1 + k)^{-i} \quad (3)$$

where the last term on the right-hand side of equation (3) is the present value of the tax shield of depreciation, PVTSD. Given the capital cost allowance (CCA) depreciation method used in Canada, the PVTSD will depend on four parameters: the corporate tax rate (t), the discount rate (k), the cost of the asset (I), and the capital cost allowance rate (d). Let us then derive an explicit expression for the PVTSD. The PVTSD will be given by the tax rate times the present value of the annual depreciation charges. That is,

$$\text{PVTSD} = t \left[\frac{D_1}{(1 + k)} + \frac{D_2}{(1 + k)^2} + \frac{D_3}{(1 + k)^3} + \dots \dots \right] \quad (4)$$

which, given the capital cost allowance method, can be written as

$$\text{PVTSD} = t \left[\frac{dI}{(1 + k)} + \frac{dI(1 - d)}{(1 + k)^2} + \frac{dI(1 - d)^2}{(1 + k)^3} + \dots \dots \right] \quad (5)$$

Factoring the term $tdI/(1 + k)$ and using the sum of an infinite geometric series,⁸ equation (5) reduces to

⁷ It is assumed here for expositional simplicity that the after-tax operating cash flow is equal to the before-tax operating cash flow times one minus the corporate rate.

⁸ Factoring the term $tdI/(1 + k)$, equation (5) can be written

$$\text{PVTSD} = \frac{tdI}{1 + k} \left[1 + \frac{1 - d}{1 + k} + \frac{(1 - d)^2}{(1 + k)^2} + \dots \right] \quad (5a)$$

The bracketed term in equation (5a) is an infinite geometric series whose sum is equal to $1/[1 - (1 - d)/(1 + k)]$. Thus, equation (5a) reduces to

$$\text{PVTSD} = \frac{tdI}{1 + k} \times \frac{1}{1 - (1 - d)/(1 + k)} \quad (5b)$$

Equation (5b) simplifies to

$$\text{PVTSD} = tdI/(k + d)$$

which is identical to equation (6).

$$\text{PVTSD} = \text{tdI}/(d + k). \quad (6)$$

Thus, for the case of a pool of assets, the NPV expression, equation (3), is expressed explicitly as

$$\text{NPV} = -I + \sum_{i=1}^n (1 - t)C_i(1 + k)^{-i} + \text{tdI}/(k + d). \quad (7)$$

If, however, the asset is sold later at the end of year n for a price of S dollars, the appropriate pool of assets will decrease, for tax purposes, by the amount of $\$S$. The resulting value of loss of tax shield, calculated as a "present value" for the end of year n , is simply expressed by equation (6) except for the replacement of I with S . The present value (as of time period 0) of this loss of tax shield of depreciation, PVLTS, is expressed by

$$\text{PVLTS} = \frac{\text{tdS}/(k + d)}{(1 + k)^n}. \quad (8)$$

Therefore, when the asset is sold at the end of year n , two opposing factors affect its NPV: (1) the present value of the selling price, and (2) the present value of the loss of tax shield. Formally stated, the NPV expression for the pool case, when the asset is sold at year n , is

$$\begin{aligned} \text{NPV} = & -I + \sum_{i=1}^n \frac{(1 - t)C_i}{(1 + k)^i} + \frac{\text{tdI}}{k + d} + \frac{S}{(1 + k)^n} \\ & - \frac{\text{tdS}}{(k + d)(1 + k)^n} \end{aligned} \quad (9)$$

which can be rewritten as

$$\begin{aligned} \text{NPV} = & -I + \sum_{i=1}^n \frac{(1 - t)C_i}{(1 + k)^i} + \frac{S}{(1 + k)^n} \\ & + \frac{\text{td}}{k + d} \left(I - \frac{S}{(1 + k)^n} \right) \end{aligned} \quad (10)$$

where the last term on the right-hand side of equation (10) is the PVTSD less PVLTS for the pool case in which the asset is sold at year n .

Equation (10) is the NPV expression presented in Canadian finance textbooks. This expression is valid only for one case, however: the pool case in which the selling price of the asset (S) is lower than both the purchase price (I) and the value of the assets in the pool (P). The NPV expression, or more specifically,

the last two terms on the right-hand side of equation (10) will be different for the cases in which $S > P$ or $S > I$. Moreover, the NPV expression will be different if the pool case is replaced with the single-asset case. In other words, when the asset is sold in year n , the present values of the after-tax selling price and the tax shield of depreciation, namely, the last two terms in equation (10), will be different, depending on the relevant case. In the following two sections the NPV expressions for the six cases allowed under tax law are given — three for the pool case and three for the single-asset case.

THE POOL CASE

When an asset is sold, the proceeds not exceeding cost are subtracted from the pool, and the appropriate CCA rate is applied to the remaining value of the pool. This approach causes the book value of the purchased asset to be irrelevant for tax purposes in the capital budgeting situation. From the tax law point of view, three scenarios can arise in the pool case, denoted here by case A: (A.1) $P \geq S \leq I$, (A.2) $P < S \leq I$, and (A.3) $P \geq S > I$, where P is the value of the pool and I and S denote, as before, the asset's purchase price and selling price, respectively.

Case (A.1): $P \geq S \leq I$

When there is sufficient asset value in the pool and the selling price is lower than the purchase price, the NPV expression is expressed by equation (10), which is the one presented in most textbooks.

Case (A.2): $P < S \leq I$

Since in this case there is insufficient asset value in the pool, the value of the pool is reduced to zero when the asset is sold for $\$S$. The excess of S over P , however, will be considered as ordinary income and will be taxed accordingly. Also, since the pool value is reduced to zero, the loss of the tax shield of depreciation upon selling the asset is attributed to P rather than to S . Hence, the NPV expression, equation (10), becomes, in this case,

$$NPV = W + \frac{S - t(S - P)}{(1 + k)^n} + \frac{td}{k + d} \left[I - \frac{P}{(1 + k)^n} \right] \quad (11)$$

where $W = -I + \sum_{i=1}^n (1 - t)C_i(1 + k)^{-i}$. As before, the second term is the present value of the after-tax proceeds resulting from selling the assets, and the third term is the present value of the tax shield of depreciation.

Case (A.3): $P \geq S > I$

When the asset is sold for more than its purchase price, in addition to the recaptured depreciation, a capital gain equal to $(S - I)$ will arise; one-half of this gain will be taxed at the corporate income tax rate (t) in the year of the disposition. Equation (10) then becomes

$$NPV = W + \frac{S - t(S - I)/2}{(1 + k)^n} + \frac{td}{k + d} \left[I - \frac{I}{(1 + k)^n} \right] \quad (12)$$

As presented in equation (12), the loss of tax shield of depreciation is, in this case, attributed to I rather than to S .

THE SINGLE-ASSET CASE

If a company has no existing pool of assets, the book value of the asset (B) or equivalently the undepreciated capital cost⁹ (UCC) in this case, as opposed to the pool case, becomes relevant to the NPV expression in a capital budgeting problem. Analogous to the pool case, three scenarios from the tax law point of view are possible in single-asset case denoted here by case B: (B.1) $B \geq S \leq I$, (B.2) $B < S \leq I$, and (B.3) $B < S > I$.

Case (B.1): $B \geq S \leq I$

Selling the existing asset for less than its undepreciated capital cost (B) will create a *terminal loss* equal to $(B - S)$, which is tax-deductible; thus, a tax shield of $t(B - S)$ can arise. The NPV expression will in this case be

$$NPV = W + \frac{S + t(B - S)}{(1 + k)^n} + \frac{td}{k + d} \left[I - \frac{S}{(1 + k)^n} \right] \quad (13)$$

where the economic meaning of the three terms on the right-hand side of equation (13) is as before.

Case (B.2): $B < S \leq I$

If the asset is sold at a price greater than the UCC but lower than the original cost of the asset, a recapture of depreciation results on which tax should be paid. The NPV expression then modifies to

$$NPV = W + \frac{S - t(S - B)}{(1 + k)^n} + \frac{td}{k + d} \left[I - \frac{B}{(1 + k)^n} \right]. \quad (14)$$

Also, unlike case (B.1), the third term, which is the tax shield of depreciation, includes the variable B rather than S .

⁹ The terms *book value* (B) and *undepreciated capital cost* (UCC) will be used interchangeably, although there is a conceptual difference between the two.

Case (B.3): $B < S > I$

As in the pool case, if the asset is sold for more than the original cost, the quantity $(I - B)$ will be a recapture, and the excess of the selling price over the original cost $(S - I)$ will be considered a capital gain, one-half of which will be taxed. The modified equation becomes

$$\begin{aligned} \text{NPV} = W + & \frac{S - t(I - B) - t(S - I)/2}{(1 + k)^n} \\ & + \frac{td}{k + d} \left[I - \frac{B}{(1 + k)^n} \right]. \end{aligned} \quad (15)$$

A numerical example for the more common case of $B < S < I$ for the single-asset case, and $P > S < I$ for the pool case might be helpful. Assume that $I = \$90,000$, $N = 7$ years, $n = 4$ years, $t = 40\%$, $k = 20\%$, $d = 30\%$, $S = \$60,000$, $P = \$500,000$ where N is the estimated economic life of the asset, n is the year in which the asset is sold, and all other notations are as before. Applying equation (10) for the pool case is expressed as

$$\begin{aligned} \text{NPV} &= W + \frac{60,000}{(1.2)^4} + \frac{0.4 \times 0.3}{0.2 + 0.3} \left[90,000 - \frac{60,000}{(1.2)^4} \right] \\ &= W + 43,590.76. \end{aligned}$$

Equation (14) for the single-asset case is expressed as

$$\begin{aligned} \text{NPV} &= W + \frac{60,000 - 0.4(60,000 - 21,609)}{(1.2)^4} \\ &+ \frac{0.4 \times 0.3}{0.2 + 0.3} \left[90,000 - \frac{21,609}{(1.2)^4} \right] = W + 40,628.47. \end{aligned}$$

Note that the UCC or equivalently B is expressed by

$$B = I(1 - d)^n = 90,000(1 - 0.3)^4 = 21,609.$$

These results indicate that given the tax provision regarding the CCA, the NPV of a project can be different depending on the relevant case. The different results will lead to different accept-reject decisions, particularly when projects of different sizes are involved. The six cases discussed above are, for convenience, presented in Exhibit 1.

CONCLUSIONS

Since the tax law for the capital cost allowance in Canada makes provisions for different circumstances on the disposition of a depreciable asset, a different NPV expression will result under

Exhibit 1. The Present Value of the After-tax Selling Price and the Tax Shield of Depreciation (Y) for Depreciable Assets under Different Cases*

| Case | The value of Y | |
|------|---|---|
| | A. Pool of assets | B. Single asset |
| 1. | $\frac{P \geq S \leq I}{S}$ $+ \frac{td}{k + d} \left[I - \frac{S}{(1 + k)^n} \right]$ | $\frac{B \geq S \leq I}{S + t(B - S)}$ $+ \frac{td}{k + d} \left[I - \frac{S}{(1 + k)^n} \right]$ |
| 2. | $\frac{P < S \leq I}{S - t(S - P)}$ $+ \frac{td}{k + d} \left[I - \frac{P}{(1 + k)^n} \right]$ | $\frac{B < S \leq I}{S - t(S - B)}$ $+ \frac{td}{k + d} \left[I - \frac{B}{(1 + k)^n} \right]$ |
| 3. | $\frac{P \geq S > I}{S - t(S - I)/2}$ $+ \frac{td}{k + d} \left[I - \frac{I}{(1 + k)^n} \right]$ | $\frac{B < S > I}{S - t(I - B) - t(S - I)/2}$ $+ \frac{td}{k + d} \left[I - \frac{B}{(1 + k)^n} \right]$ |

* The NPV expression for a depreciable asset is given by

$$NPV = -I + \sum_{i=1}^n (1 - t)C_i(1 + k)^{-i} + Y.$$

each case. The paper, therefore, planned to derive the appropriate NPV equations consistent with the provisions of the tax law. Three NPV expressions were derived under the pool-of-asset case, and similarly, three different expressions resulted in the single-asset case. The differences in the expressions lie in the disposition value of the asset compared to its original cost and the undepreciated capital cost (in the single-asset case) or the value of the existing pool of assets (in the pool case). One important implication of the analysis in this paper is that better corporate tax planning can be achieved if capital-budgeting decisions incorporate the differences in the tax provisions and their effect on the NPV expression.

Accounting and Economic Development: Relationships among the Paradigms

JAMES A. TALAGA and GORDIAN NDUBIZU*

Accounting performs a critical function in any economy since the information it generates serves society by allowing for increases in the efficiency of resource allocation among competing interests. This function is performed in market-directed economies as well as in centrally planned economies. The lack of a well-developed accounting function will necessarily result in the misallocation and suboptimization of existing resources. No developed country is without a well-developed accounting function. The complexity of the developed economy requires the kinds of economic information provided by accounting. Different economic systems may place greater or lesser emphasis on different facets of accounting, but in no case is the need for information eliminated. How the accounting systems have developed is not of immediate concern; the accounting function did develop. Interested readers can refer to Yamey and to Winjum for a discussion of the evolution of accounting in capitalist countries.¹

Accounting appears to have little place in the literature of economic development. The authors could find no citations in the economics literature that discuss, in whole or in part, the role of accounting in economic development. Apparently, development

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¹ B. S. Yamey, "Accounting and the Rise of Capitalism: Further Notes on a Theme by Sombart," *Journal of Accounting Research* (Autumn 1964), 117-36; and James O. Winjum, "Accounting and the Rise of Capitalism: An Accountant's View," *Journal of Accounting Research* (Autumn 1971), 33-50.

economists either take accounting as a given or assume that the impact of accounting is inconsequential, or both.

In the case of the less-developed countries (LDCs), a considerable body of literature exists that chronicles the role of accounting in economic development. A series of general overviews of the importance of accounting in economic development is available.² In addition, numerous other studies report on individual countries, including Pakistan, Peru, Sri Lanka, Nigeria, and Ghana.³ The lack of developed accounting systems in these countries is noted. As mentioned, this paper will not discuss whether this lack of development in accounting is a cause or effect of the lack of economic development but will only note that accounting and economic development exist concurrently. One major result of the lack of a developed accounting function is the reduced ability of the LDCs to be well integrated economically. Misallocation of resources, reduced ability to plan, and generally reduced capacity to control are common. Although not all LDCs are necessarily characterized by all of these problems, the majority of them are. Furthermore, it must be recognized that the lack of a developed accounting function is likely only to contribute to, not to be the entire cause of, these problems. The position of the authors is that the lack of a well-developed accounting function acts as a barrier to development.

The second position taken throughout this paper is that accounting needs to fit the particular circumstances of the country in which it is employed. Briston provides an extended discussion of this point.⁴ The accounting system used in LDCs should reflect

² Herman W. Bevis, "The Accounting Function in Economic Progress," *Journal of Accounting* (August 1958), 24-34; John M. Hunter, "Accounting and Economic Development," *Business Topics* (Spring 1964), 57-60; James J. Mahon, "Ledgers as Much as Lathes," *Columbia Journal of World Business* (Spring 1966), 83-87; Robert E. Seiler, "Accounting, Information Systems, and Underdeveloped Nations," *Accounting Review* (October 1966), 652-56; George M. Scott, "Private Enterprise Accounting in Developing Nations," *International Journal of Accounting* (Fall 1968), 51-66; and Adolf J. H. Enthoven, "Accountancy for Economic Development," *Finance and Development* (September 1969), 24-29.

³ Pakistan: Mahmood A. Quereshi, "Private Enterprise Accounting and Economic Development in Pakistan," *International Journal of Accounting* (Spring 1974), 125-41; Peru: Lee H. Radebaugh, "Environmental Factors Influencing the Development of Accounting Objectives, Standards, and Practices in Peru," *International Journal of Accounting* (Fall 1975), 39-56; Sri Lanka: M. H. B. Perera, "Accounting and Its Environment in Sri Lanka," *Abacus* (June 1975), 86-96; Nigeria: A. C. Ezejelue, "The Developing Profession in Nigeria," *Accountant* (England) (15 January 1976), 71-73; and Ghana: Ato Ghartey, "A New Perspective for Accountancy Education in Ghana," *International Journal of Accounting* (Fall 1978).

⁴ Richard J. Briston, "The Evolution of Accounting in Developing Countries," *International Journal of Accounting* (Fall 1978), 105-20.

the particular social, economic, and political environment present in these countries. Just as U.S. accounting practices are not entirely appropriate in the United Kingdom, neither are U.S. and/or U.K. accounting practices entirely appropriate, for example, in Nigeria. The general need for information exists in all three countries. The specific nature and quantity of information needed may, however, vary considerably among the countries. The environment and the accounting system used should match.

In practice, the pattern in many LDCs is for an existing accounting model, such as the U.K. model or the Dutch model, to have been grafted onto the existing local environment. Such a situation does not necessarily produce the desired result of an effective accounting system. Part of the reason, we argue, is that the particular politico-economic system has been linked with an inappropriate type of accounting system. The type of information required by the economic system and the information generated by the accounting system are thus mismatched.

If we consider that there are different paradigms (philosophical orientations) to accounting and to economic development, mismatches clearly can happen. The remainder of this paper will examine these paradigms and the nature of the matches. Specifically, the paradigms of accounting and of economic development, the interaction between these two, and the implications for economic development will be examined.

PARADIGMS OF ACCOUNTING

No generally accepted paradigms of accounting exist. Several methods, however, divide various forms of accounting. One method views accounting in terms of the type of economic system under which accounting must function (i.e., market-directed versus centrally planned systems). Although this method has much to commend it, for our purposes, the classification of accounting paradigms in this manner would have a high degree of redundancy with the paradigms of economic development to be presented later. Thus, a direct classification on the basis of the economic systems is not desirable. Little insight would be gained by saying that orthodox development paradigms require market-directed accounting paradigms and that political economy development paradigms require centrally planned paradigms. A more useful way to consider accounting paradigms has been provided by Yu.⁵ His views are not

⁵ S. C. Yu, "The Several Modes of Normative Accounting Thought," *International Journal of Accounting* (Spring 1974), 83-104.

necessarily accepted by all accounting scholars, but his classification provides an excellent division of the accounting discipline in terms of generating insights into the role of accounting in economic development.

Yu argues that basically two major approaches (paradigms) to accounting exist: normative thought and positive thought. Normative thought is essentially a value-based accounting system, one in which the accounting profession is free, and perhaps even required, to make value judgments of various types concerning the accounting data. Positive accounting, on the other hand, in its purest form is a value-free accounting system. Anyone using the same data and the same rules of logic must arrive at the same conclusion. As we will see, each paradigm of accounting will have a different implication for each of the different paradigms of economic development.

Normative Accounting Thought

As described by Yu, normative accounting thought is characterized by several elements: value statements, issues related to goal determination and user needs, and interpretation of accounting information. In addition to the general description of normative accounting thought, three subtypes of normative accounting are developed: ethical accounting, social welfare accounting, and user-oriented accounting.

Ethical accounting. The essential basis for ethical accounting is that the "social concepts of justice, truth, and fairness underlie all social organizations, and hence form the basis upon which accounting principles and practices rest."⁶ In terms of the accounting literature (and practice), the "fairness" aspect of accounting is the one that often predominates. Thus, in many U.S. accounting settings, we find statements to the effect that fairness is the broad objective of financial statements. It could be argued that ethical accounting represents the closest approximation to "pure" market-directed accounting.

Social welfare accounting. The essence of this type of normative accounting thought is that accounting must serve a useful social purpose. Furthermore, accounting is shaped by the social environment in which it operates and is thus a reflection of that environment. Clearly, the value structure of a society will be reflected in the structure of the accounting system. In addition, accounting serves society by facilitating the social decisions to allocate re-

⁶ Ibid., 87-88.

sources. This approach to accounting is in the style of the Dutch accounting model with its greater emphasis on the macroeconomic effects of accounting. This is still very much a market-directed approach to accounting.

User-oriented accounting. The essence of this approach is that user needs should govern and shape the content of accounting information. In this approach, accounting begins by meeting the specific internal user needs and extends the concept of user to outside groups, such as various societal groups. As a practical approach, this method has as a limitation the need to deal with a continually expanding number of external interested parties. External users can be any interested party, including those hostile to the entity. This approach to normative accounting moves further away from a market-directed approach toward a centrally planned approach.

Positive Accounting Thought

Positive accounting thought differs from normative accounting thought mainly in the manner in which it deals with the concept of value statements. Positive accounting essentially views accounting as a system that is (or should be) free of value statements. Implied in this view is a system of accounting that is derived from some authority outside the particular accounting entity. If each entity were to devise its own accounting principles, value statements would exist inherently in the system. Externally generated accounting standards, although having some value-based concepts, necessarily would have significantly fewer of these statements. In this fashion, positive accounting is more likely to develop where such central control mechanisms exist. This paradigm of accounting is not necessarily tied to centrally planned economies. The source of central control can come from a centralized accounting group, such as the Financial Accounting Standards Board in the United States, as well as from some centralized economic authority, such as the Department of Accounting and Statements of the Ministry of Finance in the Soviet Union. However, a positive system generated by a central political system will be likely to have a much greater influence on an entity than if the system were generated by some outside authority. Positive accounting thought is more consistent with strong central governments.

In the comparison of normative versus positive accounting thought, the dimensions by which we can classify accounting practices are at least two-fold. First, accounting can vary in the dimension of "objectivity," with the "pure" form of normative

accounting being the most value based and the "pure" form of positive accounting being the least value based. For this paper, this classification does not seem particularly useful. The second dimension relates to the degree of centralization of the accounting profession. The degree of centralization would reasonably be expected to increase as the paradigm followed moves toward positive accounting. This is the situation found in centrally planned economies as well as in certain aspects of accounting in advanced industrialized market economies (usually in the financial accounting practices). As the degree of centralization decreases, the predominant paradigm followed moves toward normative accounting. This situation is likely to exist in all aspects of accounting in LDCs, as well as in certain aspects of accounting in advanced industrialized market economies (usually in the managerial or cost accounting practices).

Summary Comparison of Accounting Paradigms

A set of general guidelines related to the elements of accounting relevant under positive and normative systems follows.

Development of accounting principles. Under positive systems, the pre-existence of principles, of their uniformity, and of their relative inflexibility is not assumed. Some central agency generates these accounting principles and they are applied consistently. Under normative systems, the pre-existence of principles, their uniformity, and relative flexibility is not assumed. These principles may be developed by a central group; however, their application is determined in part by the needs and desires of the individual entity.

Relationship of the accountant to the firm. Under positive accounting, accountants are attached to the firm, although they are autonomous (i.e., their primary function is to make certain that the accounting system is followed and, secondarily, that the information needs of the individual entity are being satisfied). In this paradigm, accountants could be said to be interchangeable effectively among entities. Under normative accounting, accountants are attached to the firm and are not necessarily autonomous. The accountants' primary function is to make certain that the information needs of the firm are met and, secondarily, to ascertain that the proper accounting conventions are also being met. In this case, accountants are less interchangeable among firms since the accountants must understand the needs of the firm as well as accounting principles.

Interpretation of the accounting data. Under positive accounting,

the accountant does not interpret the data. Interpretation is left to some outside (non-accounting) group. Thus, the output of the accountants' work must necessarily follow some strict set of guidelines so the work is universally interpretable. Under normative accounting, accountants must interpret the data. Interpretation of the output is still left to outside groups; however, their understanding of the data is limited by their understanding of the value system that was employed in the initial generation of the accounting data.

PARADIGMS OF ECONOMIC DEVELOPMENT

The previous discussion implies that there are different economic systems. By extension, there are different models of economic development. The development paradigms outlined here are taken from Wilbur and Jameson and from Weaver, Jameson, and Blue.⁷ As in the case of accounting paradigms, the following is not the only method to classify the thinking in the field, but it is a convenient way to present the ideas.

Wilbur and Jameson argue that there are basically two major approaches to economic development thinking: orthodox paradigms and political economy paradigms. Orthodox paradigms can be considered "free-market" paradigms, and political economy paradigms can be considered "centrally planned market" paradigms.

Orthodox Paradigms

The orthodox paradigm has a number of distinguishing characteristics. Four elements are present in the pure forms of the orthodox paradigm. First, the goal of an orthodox paradigm is usually a high mass-consumption society. Second, the system is a private enterprise economy with a representative democratic political structure. Third, the process of development is a natural historical development in which the country passes through stages. Fourth, in the pure form, the method for facilitating development is laissez faire. Such pure form orthodox approaches are usually modified by one of several sub-types.

It is argued that the pure form orthodox paradigm is not adequate for two reasons: (1) non-rational, non-maximizing be-

⁷ Charles K. Wilbur and Kenneth P. Jameson, "Paradigms of Economic Development and Beyond" in *Directions in Economic Development*, ed. Kenneth P. James and Charles K. Wilbur (Notre Dame, Ind.: University of Notre Dame, 1979), 1-41; and James H. Weaver, Kenneth P. Jameson, and Richard N. Blue, "Growth and Equity: Can They Be Happy Together?" *International Development Review* (1978), 20-27.

havior is common, and (2) market imperfections exist. The variants of the orthodox paradigm attempt to consider these limitations within the orthodox framework. Three major variants have been developed: continued laissez faire, planning response, and growth-with-equity responses. The basic premise in all is that growth is accompanied by inequality in the distribution of the results or benefits of development. A fairly wide variety of growth-with-equity proposals exists. Included among them are such strategies as the basic needs and the new international economic order approaches, to name the two most prominent. The common factor of these approaches is an increase in the amount and scope of government intervention in the marketplace.

Political Economy Paradigms

No pure form political economy paradigm parallels the orthodox paradigm. However, some of the generally accepted elements of most political economy paradigms can be developed. First, the goals of these paradigms tend to be two-fold: to enhance peoples and to enhance nations. Second, the process of development is not automatic or natural but occurs after protracted struggle. The nature of this struggle depends on who controls the economic surplus. Beyond these two fairly general philosophical points little can be said to be generally true of these paradigms. In terms of facilitating these goals, two major variants of the political economy paradigm exist: the dependency theorists and the Marxists.

Dependency theorists. Their essential argument is that specific historical and economic conditions lead to a dependent relationship between the center (developed countries) and the periphery (under-developed countries) and that this is a distortion of that which should be the true relationship, the new international economic order concept or a form of self-reliant democratic socialism (presumably including more government intervention than any of the growth-with-equity proposals).

Marxists. The essential goal is the removal of the major barrier to economic development, the capitalist system. Thus, the first element is the overthrow of the capitalist system and its replacement with a socialist system. No further development plan is provided, although the Marxists frequently turn to two models of development, the cases of the Soviet Union and the People's Republic of China. In each instance, the specifics of development of these countries are explained and applied to the particular national situation.

Unlike the paradigms of accounting, the paradigms of economic

development cannot be classified into more or less clear dichotomies. Rather, these paradigms can be considered to fall along a continuum that ranges from laissez faire at one extreme, to centrally controlled economies, to the "pure" form of the Marxist variant of the political economy paradigm at the other extreme.

RELATIONSHIPS AMONG THE PARADIGMS

Although the paradigms of accounting and of economic development represent ideas along continuums, for the sake of simplicity, the interactions among the paradigms will be represented as if there were clear lines dividing the schools of thought. More specifically, the interactions to be examined are orthodox-normative, orthodox-positive, political economy-normative, and political economy-positive.

Orthodox Development Paradigms

If a nation should choose to pursue one of the orthodox development approaches, it has the choice of normative or positive accounting. Each form of accounting has somewhat different implications for development.

Orthodox-normative. This is a consistent set of paradigms. Central to the orthodox paradigm is limited intervention by central authorities. In normative accounting, autonomy on the part of the individual entity within broad limits is implied. In both paradigms, there is less control of the economy by outside agencies than in other paradigms. In this sense, the two paradigms are compatible.

Given an orthodox development climate, normative accounting practice has three major advantages, all of which are interrelated. First, orthodox development places a larger burden on the private sector than do political economy paradigms. Thus, the private sector needs to be able to respond more readily to current and future economic conditions. Normative accounting allows the entity to adjust accounting practices more readily to changing conditions than does positive accounting practice. This flexibility is more appropriate where there is less government intervention in the marketplace.

Second, because the needs of each entity are somewhat different, the information and control requirements necessarily must also differ. In an orthodox development approach, entities that face different circumstances should be able to use the accounting method that best enables them to meet the challenges of the environment. Again, normative accounting would seem to be more consistent with this requirement than positive accounting. Thus,

normative accounting can be made relevant to the entity given a varied environment.

Third, closely allied with the concepts of flexibility and relevance is the concept of internal control. Normative accounting thought should allow the entity to control more adequately its own internal affairs. Since there is greater responsibility on the part of the firm to perform such control in an orthodox paradigm than in political economy paradigms (where part of the responsibility is shifted to the central government), normative accounting is more consistent with an orthodox paradigm.

Although it is reasonable to argue that normative accounting and orthodox paradigms are consistent with each other, the drawbacks to normative accounting in a development setting must be noted.

A reduction in the uniformity of accounting practice exists under a normative accounting system. Although this lack of uniformity is a virtue at the entity level, at more aggregate levels, such as industry-wide or national levels, this lack of uniformity creates planning problems. Planning on an economy-wide basis is seriously restricted in cases where normative accounting is applied. In those orthodox paradigms that approach the "pure" form, this is not necessarily a major problem. In those cases where the orthodox paradigm involves greater government intervention, as in the case of the growth-with-equity models, however, the reduced ability to plan can be a serious drawback of the normative approach.

Because there is greater flexibility and greater autonomy on the part of individual entities, the ability of the government to monitor the activities of these entities is reduced. One example of this is the reduced ability on the part of governments to perform efficient audits of the activities of the entity. The net result is an increased ability by entities to evade full responsibility for the tax burden.

Finally, there is the potential, in terms of investment decisions, that normative accounting practices could result in a reduction of information available to investors. Singhvi, for example, cites the poor quality of financial reports as a deterrent to increased investor activity in India.⁸ Since orthodox paradigms call for private investment, the possibility that normative accounting can discourage such investment would seem to be a serious drawback.

Orthodox-positive. This is the approach that would seem to be the most common in practice for countries pursuing policies

⁸ Surendra Singhvi, "India's Feeble Financial Statements," *Columbia Journal of World Business* (November-December 1967), 55-60.

approximating the pure orthodox paradigm. This situation is typified by the case where an LDC has "grafted" some pre-existing accounting system onto its economy. In most instances, the accounting system chosen is that of the former colonial ruler. Although the accounting system in the colonial power may be a normative system, as in the United Kingdom or in France, when transferred to the LDC, it becomes a positive system. This happens because the value system and particular circumstances that created the accounting system do not necessarily apply to the local circumstances of the LDC. The result is effectively to have a value-free system; the values inherent in the accounting system acquired through imposition may have no particular meaning or value. Thus, they are value free.

This concept of positive accounting in the orthodox case is clearly a distortion of the true concept of positive accounting. In the case of the LDCs, the accounting system is positive in the sense of structure, not in terms of function. The benefits of positive accounting — control of information, understanding, and relevance — are not always achieved because the accounting system does not match the needs of the economy.

The major problem with positive accounting in orthodox development systems is poor information due to inflexibility and irrelevance of the accounting system. As previously noted, positive accounting systems tend not to be responsive to the needs of individual entities because of their inflexibility. At the same time, all the information required and provided may not necessarily be useful; the system can both give irrelevant information and fail to give needed information.

Because of poor information, the quality of internal control by the entity is significantly reduced. Under positive accounting, how closely the information provided matches the information required is limited. Given inadequate or useless information, the management of the entity will have increased difficulty in making correct decisions. In the LDCs, where management skills are generally regarded as being moderate or low in terms of sophistication, the need for information in a proper form is even more critical. For the economy as a whole in an orthodox-positive system, a greater degree of resource waste is likely than in either an orthodox-normative or a political economy-positive system.

In an orthodox-positive system, the potential exists for more effective financial markets. Under positive accounting, the financial statements would tend to be more comprehensive and to have

more useful information. Thus, decisions made in financial markets would tend to be better. This is a clear advantage for an orthodox development system. Of course, coupled with reduced internal control, the net result is that the economy has an understandable accounting of poor internal decisions.

Finally, as mentioned earlier, under some of the orthodox paradigm variants that call for increased government intervention, positive accounting has the potential to provide more and better information for planning decisions. Although in the case of "pure" orthodox paradigms this is not necessarily important, in the case of other variants it is very important.

Political Economy Development Paradigms

As in the case of orthodox paradigms, a country choosing one of the political economy paradigms also has the choice of accounting paradigms.

Political economy-normative. A political economy development system with a normative accounting system is a mismatch. The essence of political economy paradigms is centralized control, while normative accounting is more consistent with decentralized control. Two major problems are evident as a result of this mismatch. First, necessary control is lacking. In a political economy paradigm, the information is needed to guide properly the development process. In those cases where the input form, nature, and extent of the information provided remain at the discretion of the individual entities, instances of mismatches will exist. The information provided by a normative accounting system will not necessarily be the information required by planners in a political economy development system. Lack of appropriate information will distort the development process as it will in orthodox systems. Since planning is a central element of political economy paradigms, however, the inability to perform that function effectively is much more an impediment to progress.

Second, in a political economy-normative system, the application of non-uniform accounting systems will necessarily result in imbalances between the sectors of the economy. If it is assumed that price control will exist in a political economy development system and if the individual entities are allowed to practice whatever internal accounting systems they choose, variances among the different entities will occur. As a result, the pricing mechanism will be distorted. The prices will not be an accurate reflection of the costs but will include a reflection of the accounting practice used by different entities. This, in turn, will distort the pattern of

demand for output of the economy, with the resultant development of shortages of desired goods, surpluses of undesired goods, and the creation of black markets.

Political economy-positive. A political economy-positive combination is a proper match of paradigms. The need for control by a central authority in a political economy paradigm is met, in part, by the nature of positive accounting. Specifically, the uniform, inflexible nature of positive accounting provides several advantages when applied in political economy paradigms. First, on a macro level, positive accounting provides information in the form required by planning agencies. Because accounting practice is uniform across all entities, the information generated by those entities is in a form more suitable for interpretation by some central group. Similarly, if all entities use uniform methods, information provided by the central group is more readily interpreted and implemented. Because positive accounting and political economy development systems are philosophically consistent on a macro level, an effective matching of paradigms results.

Second, on a micro level, positive accounting increases the internal control within and over the entity. Since in a political economy paradigm the government usually controls most firms, the need for internal control is two-fold: control for internal efficiency and control for societal efficiency. Both of these controls are provided by positive accounting systems. In terms of internal efficiency, uniform accounting systems help ensure that relevant information is provided. Of course, there is no guarantee that the information will be used. The uniformity aspect of positive systems would tend to ensure that the information is provided because the system must be designed so that it can be applied in a wide variety of circumstances. This requirement for both a general design and specificity should result in the provision of necessary information. Positive accounting systems in political economy paradigms thus should increase internal control. The second aspect of internal control is for societal efficiency. Positive accounting systems, through the uniformity aspect, help government planners understand the firm's internal operations in a manner that allows for more efficient calculation of costs of operation and production. Through proper use of this data, it should be possible to set prices more efficiently and to provide for a better allocation of output. Positive accounting is consistent with the resource allocation aspect of political economy paradigms.

CONCLUSION

The basic premise of this paper is that the role of accounting in economic development is important. However, the study of this role has been essentially ignored by development economists and has been viewed in a culturally biased fashion by accountants. This paper has proposed that different paradigms of economic development require different and developmentally consistent paradigms of accounting. Orthodox development systems were demonstrated to be generally better served by normative rather than positive accounting systems, and political economy development systems were found generally to be better served by positive rather than normative accounting paradigms.

Additional Fund Allocation Constraints for Common Stock Investments: An Empirical Analysis of Regional Portfolios in the Common Market and the United States

AVI RUSHINEK and SARA F. RUSHINEK*

Pioneers on the subject of portfolio diversification include Markowitz,¹ and subsequent research by Sharpe and Lintner² advanced additional assumptions, while both of the latter authors developed independent versions of a theory of capital asset pricing.³ Although it is not the intention to reiterate these theories here, the rudimentary concept is central to the present study. The capital asset pricing theory identifies a shareholder's relevant risk when combining shares into portfolios in an efficient market. The identifiable risk, as in the case of a single security, is known as the nondiversifiable component and is measured by the correlation of the return of the security with that of other securities in the opportunity set.

As a stepchild of domestic theories, international diversification is relatively new and is fundamentally different. That difference stems from the multiplicity of economies with potential investments.

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¹ H. Markowitz, "Portfolio Selection," *Journal of Finance* (March 1952), 77-91.

² W. F. Sharpe, "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance* (September 1964), 425-42; and J. Litner, "Security Prices, Risk, and Maximal Gains from Diversification," *Journal of Finance*, vol. 20, no. 3 (1965), 588-615.

³ R. A. Cohn and J. J. Pringle, "Imperfections in International Financial Markets: Implications for Risk Premia and the Cost of Capital to Firms," *Journal of Finance* (March 1973), 59-66. They state that the theory proposed by Markowitz was essentially normative. See Markowitz, "Portfolio Selection."

Traditionally, a domestic investor isolated individual securities for investment purposes. In contrast, an international investor focuses attention on overall economic fluctuations of an individual country. As Levy and Sarnat note, the rationale is that "within an economy a strong tendency usually exists for economic phenomena to move more or less in unison . . . this also holds true for individual securities."⁴ One might assume that an international diversification strategy would establish an opportunity set of countries in construction of a portfolio of international securities. Thus, it would become necessary to study the correlation among those countries in the opportunity set. If economic activity in different countries proves to be less than perfectly correlated, diversification appears to be favorable from a risk-return vantage point.

Since those pioneering writings cited, portfolio diversification has had extensive study. Most of the empirical studies, until very recent times, have been limited, however, by their parameters. Cohn and Pringle note that most works have been limited to common stocks in the U.S. capital market.⁵ Therefore, portfolio theory as it applies to international capital flows has been largely neglected. In a review of a work by Lee, Clark and Haas mention this same sentiment: "The application of portfolio theory to international capital flows is long overdue of funds between countries which traditional theory has been unable to explain."⁶

The idea of international diversification is to determine whether any possible gain can be attained by adding foreign securities to an optimal portfolio of domestic securities. Lee emphasizes that if general economic activity movements of foreign countries are not in correlation to one another, it may be possible to reduce common risk by including combinations of securities from these respective countries in a portfolio.⁷ Thus, as Jacquillat and Solnik suggest, this relative independence between various national economies and their stock price behavior provides the advantages to diversify internationally.⁸

⁴ H. Levy and M. Sarnat, "International Diversification of Investment Portfolios," *American Economic Review* (September 1970), 668-75.

⁵ Cohn and Pringle, "International Financial Markets," 59-66.

⁶ P. B. Clark and R. D. Haas, "The Portfolio Approach to Capital Movements: A Comment," *Journal of Political Economy*, no. 3 (1972), 612-16.

⁷ C. H. Lee, "A Stock-Adjustment Analysis of Capital Movements: The United States-Canadian Case," *Journal of Political Economy* (July/August 1969), 512-23.

⁸ B. Jacquillat and B. H. Solnik, "Multinationals Are Poor Tools for Diversification," *Journal of Portfolio Management* (Winter 1973), 8-12.

Various authors and diverse methodologies have been devised to treat international diversification. Lessard, appearing rather unique in his focus on a set of developing Latin American countries, proposes diversification through an investment union concept.⁹ Alternatively, Agmon views share price behavior in equity markets of developed countries, as does Ripley in a study of systematic covariation.¹⁰ The vast majority of studies indicate concomitance of developing/underdeveloped countries with more developed countries. The work of Levy and Sarnat is consistent with the preponderance of research and provides a base of Pearson product-moment (intercountry) correlation coefficients to examine as well.¹¹

When risks are considered, international diversification is likely to raise common stock returns at a given risk (variability level) compared to an all-domestic portfolio. Such an internationally diversified portfolio requires establishing subportfolios of homogeneous risk (correlation) with respect to security returns, within each portfolio.¹² At the same time, the between-portfolios risk-heterogeneity (correlation) should be maximized. The present study contributes the multicountry subportfolio theory to the existing "single-country" subportfolio. Exhibit 1 presents a simplified version of the subportfolio model based on Solnik and Lessard.¹³ The exhibit indicates the relationship among the return of stock and country aggregate and the countries aggregate to the world. Formally, the model can be expressed as:

$$\beta_{k,w} = \sum_{k=1}^{k=y} \sum_{i=1}^{i=m} \sum_{w=1}^{w=1} \beta_{k,i} \beta_{i,w} \quad (1)$$

where:

Σ = sum of β products

m = number of countries

⁹ For additional information on the investment union concept, see D. R. Lessard, "International Portfolio Diversification: A Multivariate Analysis for a Group of Latin American Countries," *Journal of Finance* (1979), 619-34.

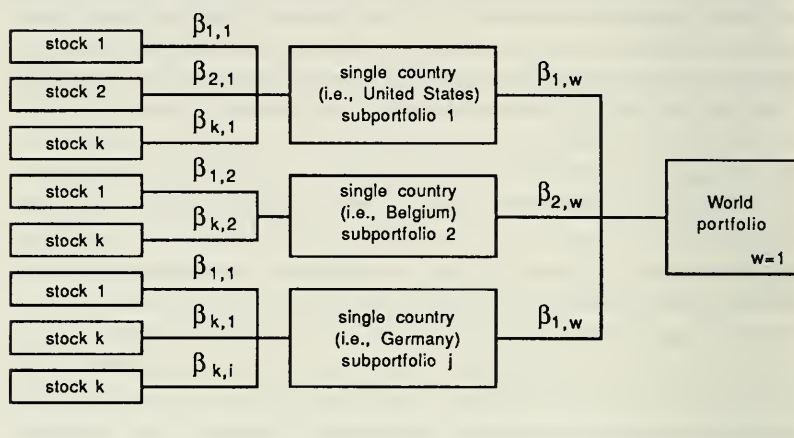
¹⁰ T. Agmon, "The Relations among Equity Markets: A Study of Share Price Comovements in the United States, United Kingdom, Germany and Japan," *Journal of Finance*, vol. 27, no. 2 (1972), 839-55; and D. M. Ripley, "Systematic Elements in the Linkage of National Share Market Indices," *Review of Economics and Statistics*, no. 3 (1973), 356-61.

¹¹ Levy and Sarnat, "International Diversification," 668-75.

¹² "Subportfolio" is defined as an entire market or any portion thereof.

¹³ B. H. Solnik, "The International Pricing of Risk: An Empirical Investigation of the World Capital Market Structure," *Journal of Finance* (May 1974), 365-78; and D. R. Lessard, "World Country and Industry Relationships in Equity Returns: Implications for Risk Reduction through International Diversification," *Financial Analysts Journal* (January-February 1976), 32-38.

Exhibit 1. Single Country Subportfolio Model



y = number of stocks

i = an index for return on country

k = an index for return on common stock

w = an index for return on the aggregated world market

$\beta_{k,w}$ = percentage change in return on common stock k per unit of percentage change in the world market

$\beta_{k,i}$ = percentage change in the return on stock k per unit of percentage change in country i subportfolio

$\beta_{i,w}$ = percentage of change in the return of stock in country i per unit of percentage change in the world portfolio w .

In addition to the "single-country" (existing) model, this present study proposes to supplement the current model with an additional level, that of a multicountry portfolio, called a multicountry model. Accordingly, the multicountry model may be expressed as follows:

$$\beta_{k,w} = \sum_{k=1}^{y} \sum_{i=1}^m \sum_{j=1}^n \sum_{w=1}^1 \beta_{k,i} \beta_{i,j} \beta_{j,w} \quad (2)$$

where:

Σ = sum of β products

y = number of stocks

n = number of subportfolios

m = number of countries

k = an index for return on common stock

i = an index for return on country

j = an index for return on multicountry subportfolios

w = an index for return on worldwide portfolio (contains several multicountry portfolios)

$\beta_{k,i}$ = same relation stated in equation one (1)

$\beta_{i,j}$ = percentage change in common stock return in country portfolio i per unit of percentage change in the aggregate multicountry subportfolio j

$\beta_{j,w}$ = percentage change in multicountry subportfolio j for a unit change in the total world portfolio w

$\beta_{k,w}$ = percentage change in common stock k per unit of percentage change in the aggregate world portfolio w .

The multicountry subportfolio model (Exhibit 2) includes several single country subportfolios. These are regional portfolios for such areas as Europe, the Pacific Basin, and North America. A worldwide portfolio will be composed of several regional (multicountry) portfolios. See Exhibit 2.

The primary problem of this study is the allocation of funds among countries. Accordingly, the present study determines the proportion (P) of each country in the multicountry subportfolio; it is formally expressed as

$$\beta_{i,w} = \sum_{i=1}^m \sum_{j=1}^n \sum_{w=1}^w P_{i,j} \beta_{i,j} \quad (3)$$

where:

Σ = sum of β products

m = number of countries

n = number of subportfolios

w = an index for return on the aggregated world market

i = index for return on country portfolios

j = index for return on multicountry subportfolios

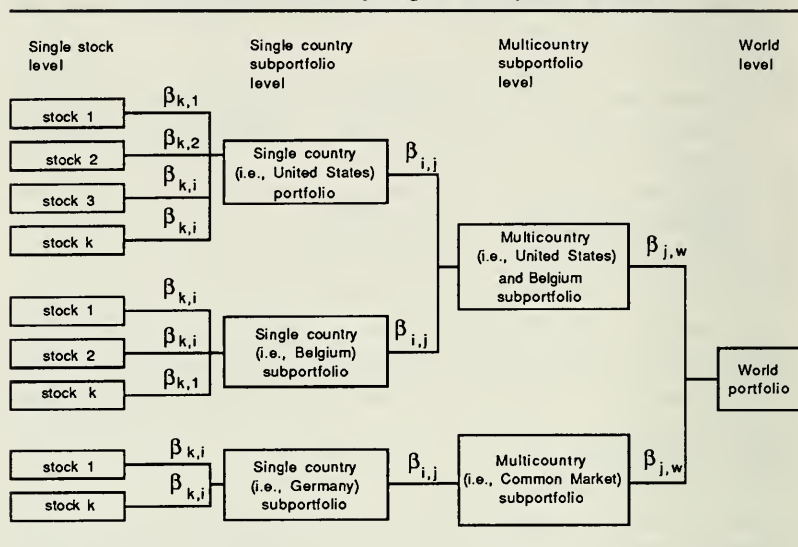
$\beta_{i,w}$ = same relation as equation one (1)

$\beta_{i,j}$ = same relation as equation two (2)

$P_{i,j}$ = proportion of investment in country i in multicountry subportfolio j .

The proportion (and mix) of countries in a given subportfolio may also become constraints in maximizing the return on a given portfolio through its subportfolios such that a formal expression would appear as follows, according to Agmon, Jacquillat and Solnik, and Markowitz:¹⁴

¹⁴ Agmon, "Relations among Equity Markets: A Study of Share Price Comovements in the United States, United Kingdom, Germany and Japan," *Journal of Finance* (1973), 839-55; Jacquillat and Solnik, "Multinationals Are Poor Tools"; and Markowitz, "Portfolio Selection."

Exhibit 2. Multicountry Regional Subportfolio Model

$$\max. \quad \Sigma R_{w,t} = \alpha_t + \beta_{j,w,t} F_{w,i,j} \quad (4)$$

$$\text{subject to: (1) } \beta_{i,w} = P_{i,j} \beta_{i,j} \quad (4.1)$$

$$(2) P_{i,j} = a_{i,j}^2 / \sum_{i=1}^m \sum_{j=1}^n a_{i,j}^2 \quad (4.2)$$

where:

$R_{w,t}$ = return of world portfolio w in period t

α_t = a return common to all securities

$\beta_{w,j,t}$ = Beta attribute of world portfolio w on multicountry subportfolio j in time t¹⁵

$F_{w,i,j}$ = return on subportfolio j for country i for world portfolio w.

METHODS, PROCEDURES, AND DATA COLLECTION

Intercountry correlation coefficients for five Common Market countries and the United States are examined in this study. The original (raw) data, calculated from common stock indices and

¹⁵ Beta (β) is a measure of the volatility, in the smallest case, of an individual security's return relative to market returns. As stated in (1), the market was defined as the return on country subportfolio i. Therefore, it was designated as $\beta_{k,i}$. Volatility (or risk) may be defined as fluctuation deviations of a single security in relation to the market (country subportfolio, multicountry subportfolio, or

exchange rates representing the years 1951 through 1967, were collected from various issues of *International Financial Statistics* of the International Monetary Fund (IMF).¹⁶ This study investigates the amount of correlation among the six countries presented. Countries (if any) found to exist in similar correlation are classified into a group or subportfolio. The correlation among the countries' returns in a designated subportfolio will be maximized while the opposite is true between subportfolios. In the latter case, the correlation among countries' returns is minimized between (or across) subportfolios. Thus, international portfolio diversification is maximized by minimizing the correlation(s) between subportfolios.

The analysis to follow will use a factor analysis procedure to reduce this relatively large mass of data (six-country matrix) to view any underlying patterns which may exist but are obscured in the correlation matrix. Factor analysis is a preferred technique for dealing with risk according to Ross, and Peasnell, Skerratt, and Taylor.¹⁷

Levy and Sarnat have provided the data explored in the present study.¹⁸ The six countries reviewed are part of a stated universe of twenty-eight countries. It should be emphasized that these six countries were not part of any optimal portfolios generated by Levy and Sarnat; rather, most appear to have a high intercountry correlation. These high intercountry correlations indicate that in an effort to reduce risk, diversification among these countries would be a difficult task using traditional methods. Accordingly,

world portfolio) or the deviation of one subportfolio to another (subportfolio) or in relation to world portfolio. Beta is formally expressed as:

$$\beta_{k,u} = \text{cov}(r_{k,u}r_k)/\sigma_u^2$$

where:

k = return of security k

u = return of designated market

r_k = return of individual security k

σ^2 = variance of designated market u

$\beta_{k,u}$ = volatility of an individual security's returns k, relative to market return u.

¹⁶ International Monetary Fund, *International Financial Statistics* (1967).

¹⁷ S. A. Ross, "Return, Risk and Arbitrage," in *Risk and Return in Finance*, vol. 1, ed. I. Friend and J. L. Bicksler (New York: Ballinger, 1977), 189-218, and "The Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory*, no. 2 (1976), 341-60; K. V. Peasnell, L. C. L. Skerratt, and P. A. Taylor, "An Arbitrage Rationale for Tests of Mutual Funds Performance," *Journal of Business Finance and Accounting* (Autumn 1979), 373-400.

¹⁸ Levy and Sarnat, "International Diversification," 668-75.

the present study offers a nontraditional method of factor analysis to facilitate diversification.¹⁹

OBJECTIVE, PROBLEM, AND HYPOTHESIS

The present study endeavors to reduce the variables (in number) to a small set which can be easily managed. During the reduction process, the unique (or nonredundant) information is retained. When redundant information is removed, the new set of variables is more succinct.²⁰ Since data reduction is a primary objective here, the data-reduction hypothesis is to be tested. Additionally, this study will construct a model to identify areas of similarly correlated countries according to their respective stock returns.

One problem, with which this study attempts to deal, is the excessive amount of redundant information which presents a kind of smoke screen to the decision maker. The problem is noted to be three-sided. First, the redundant or excessive information is burdensome and wasteful in performing the analysis. Second, input data being applied to mathematical models must often be in a succinct form as a requisite to conform to model parameters. Third, the identification of common economic phenomena affecting stock returns of the various countries considered is a problem peculiar to this analysis. The following analysis presents a model such that countries may be grouped according to similarity of security return movements. This model of country groupings (or clusters) should solve some of the problems that isolating the effects economic phenomena has on stock returns across countries, and, although not looking for causality (security return movement), the way the countries move in relation to each other is explored. The major objective is to diversify a portfolio of stocks held across some, or all, of the countries in the designated opportunity set.²¹

The hypothesis of this study is based on the literature review. This review indicates that some redundancy among the country

¹⁹ "Factor analysis" is a name applied to a very diverse set of procedures. In as much as the present study examines intercountry correlations of country security prices, it is an exercise of factor analysis as well. The analysis has been constructed so that the reader is simultaneously exposed to an advancement of diversification techniques and a step-by-step process of several factor-analytic procedures. See Nie et al., *Statistical Package for the Social Sciences (SPSS)*, 2nd ed. (New York: McGraw-Hill, 1975).

²⁰ Redundant information is that which is conveyed by more than one variable. Note that the terms "variable(s)" and "country(ies)" are used interchangeably. The term "country variable" is equally applicable.

²¹ The opportunity set used in this analysis includes the six countries composed of five Common Market countries and the United States.

variables may exist. Concomitant with the work of Levy and Sarnat²² is the objective of the foregoing analysis in determining any potential gains to investing across some or all of those countries in the opportunity set. In this study, those six countries are Belgium, France, Germany, Italy, the Netherlands, and the United States. More succinctly, this hypothesis asks whether one can differentiate between the risks among those countries in the opportunity set so as to diversify a portfolio of international scope. The hypothesis is formally stated as:

$$H_0: a_{1,1} = a_{1,1} = \dots a_{m,n} \text{ (null hypothesis)}$$

$$H_A: a_{i,j} \text{ are unequal (alternate hypothesis)}$$

where:

H_0 = null hypothesis

H_A = alternate hypothesis

i = an index for the number of variables (countries)

j = an index for the number of subportfolios (factors)

m = the number of countries (variables: six in this case)

n = the number of subportfolios (factors: two in this case)

$a_{i,j}$ = the factor loading coefficients

$a_{1,1}$ = the factor loading of country 1 in subportfolio 1.

The null hypothesis (H_0) states that all the factor loadings (or risks associated with the countries in the opportunity set) are equivalent, thereby making none of the factor loadings significant.²³ That is, diversification cannot be attained using the opportunity set of the six countries because they are all of equal risk.

The alternate hypothesis (H_A) states that the factor loadings are unequal so that significant factor loadings may be isolated. Thus, risk diversification may be achieved.²⁴

RESULTS AND DISCUSSION

The analysis that follows is built on the Pearson correlation matrix presented in the Appendix. As previously mentioned, Levy and Sarnat note that within the confines of a single economy, many

²² Levy and Sarnat, "International Diversification," 668-75.

²³ When the null hypothesis (H_0) has equal factor loadings, indicating equivalent risk inherent in all of the countries, the factor analysis procedure cannot reduce the data any further than the Pearson product-moment correlation coefficient matrix in original form. Thus, if the null hypothesis is accepted, the analysis is halted; diversification cannot be accomplished.

²⁴ In speaking of diversification, this does not necessarily imply perfect diversification (which would be elimination of all systematic risk; in reality, this is impossible). However, substantial reduction in the unsystematic component (that which may be eliminated by characteristic movements in the stock or variable itself) is assumed.

associated phenomena may move in close conjunction.²⁵ Similar movements are also noted in security prices as well as in industries. Thus, diversifying internationally is designed to check those movements of one economy with counter movements of another.²⁶ The emphasis is that similarly correlated economies cannot contribute to a portfolio of internationally held securities. This same concept was discussed when the null hypothesis was introduced. The explanation is that securities held together and subject to much of the same economic phenomena result in an increased risk to the entire portfolio. To detect such movements (of securities against each other), the correlation between countries represented in the opportunity set must be studied.

The first step in the analysis involves calculation of appropriate measures of association for the relevant variables for intercountry correlation. Since most factor analyses require input in the form of product-moment correlation coefficients, one begins with a Pearson product-moment correlation coefficient matrix from Levy and Sarnat presented in the Appendix.²⁷ Thus, as Aaker and Day note, the variables have been standardized. It is particularly useful since it allows comparability of different currencies.

In the Appendix, redundant information is immediately observable for the pairs of variables with a high correlation. If data reduction is possible, the variables should be able to be grouped together and form a variable called a risk factor.²⁸ The factor

²⁵ In the ongoing analysis, the theoretical argument of the closed economy is omitted. However, for diversification purposes, a set of closed economies would appear theoretically superior to a group of open economies. The former would tend to have substantially less external influence. See Levy and Sarnat, "International Diversification," 668-75.

²⁶ The emphasis here is entirely on movements of securities when speaking of so-called economic phenomena. This does not necessarily imply that all stocks in a given economy move together. However, this is more likely the case than not. Some stocks may move opposite economic swings or may move in close accordance to a recurring time lead or lag. In addition, compounding any analysis is the fact that one economy can exert dominance over another (such as the United States dominating the Canadian economy).

²⁷ Aaker emphasizes that because of the fact that most factor analyses begin by first calculating a correlation matrix, the variables become standardized. Standardization is necessary for all variables in order that they (variables) may be used interchangeably. Thus, the rates of return (in this study) are relevant rates for investors in dollars or any other unit of currency. See Levy and Sarnat, "International Diversification," 668-75; and D. A. Aaker and G. S. Day, "Factor Analysis: An Exposition," *Marketing Research* (January 1980), 163-71.

²⁸ A factor is a variable which is deduced and constructed from the observed variables (the opportunity set) and is used as input (variables) for further analysis. Accordingly, it is a regrouping of these same original, redundant input variables (1-6). Here, each factor represents a high diversification subportfolio.

represents less redundancy. It should be emphasized that the factor analysis employed here is based on variables (countries) and is known as an R-factor analysis, according to Holley and Guilford.²⁹ Cattell emphasizes that to extract common factors properly, the original data must meet the condition of having (at least) an interval level of measurement with multivariate-normal distribution.³⁰

In the second step of the factor analysis, the possibilities of reducing the original (redundant) data are explored. The objective is to construct a new set of countries (variables), known as sub-portfolios (factors), to achieve data reduction. Exhibit 3 represents the new set of subportfolios (factors) described by a factor matrix using the principal factor with iterations.³¹ When the principal component method (also termed principal factor analysis) is applied, new factors are no more than an exact mathematical transformation of the original data. Note that the factors are orthogonal to one another. That is, the factors are uncorrelated. The reason this method is preferred is that no particular assumptions as to the underlying structure of the countries (variables) are required. However, the most important part of the second step is the substantial amount of data reduction that occurs. Instead of six countries (variables), there are now two factors.³² Exhibit 3 presents an initial solution and, as urged by Cattell,³³ attribution of names

Exhibit 3. Factor Matrix Using Principal Factor with Iterations

| | Factor 1 diversification subportfolio 1 | Factor 2 diversification subportfolio 2 |
|-------------------|---|---|
| Belgium | .89116 | -.45084 |
| France | .66171 | .09113 |
| Germany | .80560 | .20646 |
| Italy | .70962 | .68890 |
| The Netherlands | .81129 | .06174 |
| The United States | .06043 | -.55083 |

²⁹ J. W. Holley and J. P. Guilford, "A Note on the G Index of Agreement," *Educational and Psychological Measurement* (1964), 749-53.

³⁰ Ibid. If this analysis were to use a correlation matrix of units (such as objects, individuals, communities, etc.) it would be labeled a Q-factor analysis according to Holley and Guilford.

³¹ Principal factoring with iterations is a preferential method of factoring in the present study. For more detailed information, see Nie et al., *Statistical Package*.

³² The newly evolved factors represent a conglomerate of variables and as such depict a reduced form.

³³ R. F. Cattell, "Factor Analysis: An Introduction to the Essentials: (I) The Purpose and Underlying Models, (II) The Role of Factor Analysis in Research," *Biometrics*, no. 2 (1965), 190-215, 405-35.

(for the factors) is deferred until the terminal solution. To make the variables more meaningful, the factor matrix is rotated as a preliminary to the terminal solution. The initial solution, which is based on the principal component model, may be succinctly expressed quantitatively as follows:

$$z_i = a_{i,1}F_1 + \dots a_{i,j}F_j + a_{m,n} + e_i \quad (5)$$

where:

z_i = original country i return in standardized form

$a_{a,j}$ = standardized multiple regression coefficient of country (variable) i on subportfolio (factor) j

F_j = multicountry subportfolio (factor) j return replacing the original countries (variables) return

e_i = an error term which includes all sources of unexplained variance in country i that cannot be accounted for by all of the risk region (factors)

i = an index for the variables (countries: 1, 2, . . . , 6)

j = an index for the subportfolios (factors: 1 and 2)

n = number of subportfolios (factors: n = two factors in this case)

m = number of countries (variables: m = six countries).

Exhibit 3 represents the initial solution derived from the orthogonal unrotated factors in order of their importance. Note that most of the variables (or countries) load high on a single factor (factor 1); thus, factor 1 could almost be considered a general factor. That is, most of the variables load significantly on all of the factors. Variable 4 (Italy), however, loads somewhat high on both factors.³⁴ Therefore, to avoid any ambiguity and possible erroneous results, any name attribution of the factors is further reserved for the terminal rotated (orthogonal) solution.³⁵

Exhibit 4 presents additional data reduction explanations. In doing so, it presents the following: (1) the further description of the variables; (2) the percentage of variance (pct of var); and (3) the cumulative percentage of variance (cum pct) in the original six (dependent) variables explained by each of the two new (independent) factors. The two new subportfolios (factors) can now replace the six original countries (variables) which have displayed high redundancy.

³⁴ Nie et al., note that if a variable loads significantly on more than a single factor, or that the variable's complexity is greater than one (indicating that the meaning of the respective variable is no longer simple), measurement of more than one theoretical dimension has occurred. See *Statistical Package*.

³⁵ Cattell, "Factor Analysis."

Exhibit 4. Final Communalities and Percentage of Common Variance Accounted for by Unrotated Factors

| Country variable | Communality | Diversification factor | Eigenvalue | Variance | Cumulative percentage |
|-------------------|-------------|------------------------|------------|----------|-----------------------|
| Belgium | .99742 | 1 | 3.47894 | 77.10 | 77.10 |
| France | .44616 | 2 | 1.03600 | 22.90 | 100.00 |
| Germany | .69161 | | | | |
| Italy | .97814 | | | | |
| The Netherlands | .66200 | | | | |
| The United States | .73959 | | | | |

Communality, an interpretative tool, is the total variance of a variable (original) accounted for by a combination of all the common factors and is mathematically calculated as:

$$h_i^2 = \sum_j^m \sum_j^n a_{ij}^2 \quad (6)$$

where:

Σ = sum of factor loadings

i = an index for country (variable) i

j = an index for subportfolio (factor) j

h_i^2 = communality for country (variable) i

$a_{i,j}^2$ = factor loading of country (variable) i on subportfolio (factor) j squared

m = the number of countries

n = the number of subportfolios.

An interpretive example (of communality) is illustrated in Exhibit 4 where virtually 100 percent (99.7) of the variance in the first country (variable [1]) is not common to the other countries (variables). The other variables would be interpreted similarly.³⁶

The eigenvalue is introduced for additional interpretation of data. An eigenvalue, in singular, is the amount of the total variance in the original data explained by a given subportfolio (factor). It shows the relative importance of the particular subportfolio (factor). The sum of eigenvalues is a measure of the total variance existing (in this case) in the two subportfolios. The calculation of an eigenvalue (using factor 1 as an example) is accomplished by taking all correlations between factor 1 and countries (variables) one

³⁶ To reiterate, the communality is the percentage of a country's (variable's) variance which contributes to its correlation with other countries (variables). It may also be said that it is the proportion of variance which one country (variable) has in common with the other countries (variables).

through six, independently squaring them and summing the squares.³⁷ The other factor would be similarly calculated. Quantitatively, this would be accomplished by applying the formula previously presented where:

$i = 1, 2, \dots, 6$, countries

$j = 1$ subportfolio

In turn, the communality of the respective countries (variables) is used in computation of the portion of explained variance by each subportfolio (factor).³⁸ The calculation is as follows:

$$\text{pct of var } F_j = \frac{\sum_i^m \sum_j^n a_{i,j}^2}{\sum_i^m h_i^2} \quad (7)$$

where:

Σ = sum of commonalities

pct of var = percentage of variance in countries (variables) explained by F_j

j = an index for subportfolio (factor) j

i = an index for country (variable) i

n = number of subportfolios

m = number of countries

F_j = return (score) of subportfolio (factor) j ³⁹

$a_{i,j}^2$ = squared loadings for country (variable) i on subportfolio (factor) j

h_i^2 = communality of i countries (variables).

The varimax rotated factor matrix is presented in Exhibit 5 and is the terminal solution. As Aaker and Day note, the varimax rotational method is probably the most popular employed method (or rotation).⁴⁰

³⁷ When a single eigenvalue is expressed as a percentage of the total sum of eigenvalues, it provides an easy reference to the relative importance of the associated function.

³⁸ Explained variance is a measuring device of the amount of original variance contained within the six countries (variables) represented by a subportfolio (factor). The percentage of variance explained is proportional to the summation of the squared loading associated with the respective subportfolio (factor).

³⁹ A factor score represents the values (returns) of a portfolio (factor). Factor scores are analogous to the original six countries (variables). Factor scores, in contrast to country (variable) scores, are calculated from the observed (original) variable scores. Thus, factor scores are deduced (or derived) rather than being observed. The derivation (factor scores) is computed from the coefficients presented in Exhibit 6.

⁴⁰ The varimax rotation method looks for a set of factor loadings so that each factor will have some loading(s) near zero (0), negative 1 (-1), or positive 1 (+1). The logic is that when variable-factor correlations are near -1 or +1, rotating facilitates efficiency for interpretation. That is, there exists a clear association

Exhibit 5. Varimax Rotated Factor Matrix: A Terminal Solution

| | Factor 1 Common Market subportfolio | Factor 2 Belgium-U.S. subportfolio |
|-------------------|---|--|
| Belgium | .34270 | .93807* |
| France | .54545* | .38444 |
| Germany | .72931* | .39965 |
| Italy | .98884* | -.01821 |
| The Netherlands | .63459* | .50922* |
| The United States | .10591 | .85345* |

* Highly significant factor loadings.

Using orthogonal rotation will maximize differences between pairs of factor loadings for each country (variable) to reduce factorial complexity.⁴¹ Identification of the uniqueness of each factor combined with the designation of an appropriate name may become an arduous task and depends largely on the number of factors which are often attributed to delineating the significance of the respective variable(s). Variables (or a variable) which load(s) the highest on each factor become(s) the primary determinant in construction of the factor. Thus, both the high loading and the subsequent consideration for inclusion into the factor contribute to the name of the factor (or cluster factor if more than one variable is deemed significant). According to Rao, significance (of a variable) occurs when a loading greater than 30 percent is attained on a factor.⁴² It should be noted that a variable should load high only on one factor, thus having lower loadings on any other factors. These highly significant factor loadings are indicated in Exhibit 5.

In Exhibit 5, the countries (variables) that loaded high on factor 1 are France, Germany, Italy, and the Netherlands. Thus, most

between the variable and the factor. However, if variable-factor correlation(s) is (are) near zero, disassociation is evident.

Additionally, principal components and the varimax rotation methods constrain the factors to be orthogonal (uncorrelated) or geometrically perpendicular. There are additional rotation methods available which allow the factors to be correlated or geometrically oblique. However, due to the specialization and inherent interpretive problems arising from their usage, these methods are not used in the present study. Moreover, the objective of this study is to minimize the correlations among the subportfolios (factors) which could be accomplished only in an orthogonal rotation.

⁴¹ Factorial complexity refers to the dimensional measurement of a variable. This is the same dimensional aspect previously formally stated.

⁴² R. C. Rao, "Estimation and Tests of Significance in Factor Analysis," *Psychometrika* (January 1955), 93-111.

Common Market countries load the highest on factor 1 compared to factor 2. To simplify the naming, the authors call factor 1 the Common Market factor. This leaves two countries with significant loadings on the second factor (2): Belgium and the United States. The second factor, which has been named Belgium and the United States, poses an interesting phenomenon that may lead to a theoretical hypothesis. One might hypothesize that Belgium has stronger economic ties with the United States than with the Common Market countries. No empirical evidence supports this, however; probing this phenomenon warrants its own analysis.

In retrospect, a comparison of the initial and terminal solutions indicates that most countries (variables) had a factorial complexity of 1. However, Italy displayed a factorial complexity of 2; thus, interpretation of that particular country (variable) is subject to a great deal of ambiguity initially. On the other hand, the terminal solution clarified all of the countries (variables) displaying a factorial complexity of 1. Two of the six countries (variables) (Belgium, the United States) were found to load highest on factor 2 with the remaining countries (variables) loading highest on factor 1.⁴³ This confirmed the emphasis Cattell placed on attribution names to the factors until the terminal solution.⁴⁴

The most outstanding advantage to using the varimax rotated factor matrix is the ability to minimize the correlation between the subportfolios (factors). The varimax rotated factor matrix will also minimize the correlation among the returns of the two subportfolios (based on the two factors), the Common Market and the Belgium-U.S. portfolio. The diversification will be maximized in terms of minimizing the correlation among subportfolios.

The internal structure of each portfolio should be determined by the relative weight of the squared factor loadings. Accordingly, the investment in France's common stock as a percentage of the Common Market subportfolio should be computed as follows:

$$P(\text{France}) = (.54545)^2 / (.34270)^2 + (.54545)^2 + (.72931)^2 + \dots + (.10591)^2$$

where:

P = percentage of the Common Market subportfolio.

In general, the portfolio (as well as the subportfolio) structure

⁴³ Note that the Netherlands' loading is almost equal on both factors. Thus, the Netherlands is the most complex and dependent variable.

⁴⁴ Cattell, "Factor Analysis."

will have an additional constraint which will be determined by the significant factor loadings in the following way:

$$P_{i,j} = a_{i,j}^2 / \sum_{i=1}^m \sum_{j=1}^n a_{i,j}^2 \quad (8)$$

where:

Σ = summation of

$p_{i,j}$ = proportion of investment in country (variable) i in subportfolio (factor) j

$a_{i,j}$ = factor loading of country i in subportfolio j

i = index for the countries (variables)

j = index for the subportfolio (factor)

m = number of countries (variables: 1, 2, . . . , 6)

n = number of subportfolios (factors: 1, 2).

Computation of factor scores is usually appropriate and useful at this stage of the analysis. As a matter of fact, a completed solution warrants such estimation (of factor scores) from observed (raw) variables data. Accordingly, as a supplement to the previously held solution (terminal), a factor-estimate (or factor-score coefficient) matrix is provided in Exhibit 6. The factor scores matrix is composed of the regression weights used to estimate factors from the observed six (dependent) variables. The observed (redundant) set of raw data (the six variables) may now be condensed. The reduced form that has evolved is the factor-scores (the two subportfolios). These two (independent) subportfolio returns may be used more effectively as investment regions in subsequent data analysis rather than using the original six (dependent) countries realized to contain redundancy. Thus, comparisons of this study arising from subsequent works (based upon the previous factors) may be entertained more efficaciously.

Exhibit 6. Factor Coefficients Matrix

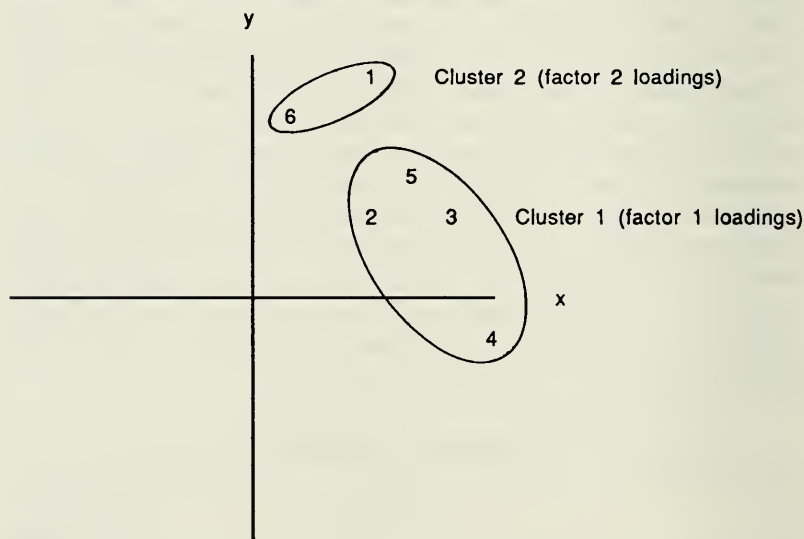
| | Factor 1 Common Market subportfolio | Factor 2 Belgium-U.S. subportfolio |
|-------------------|---|--|
| Belgium | .34494 | 1.31729 |
| France | -.25847 | -.32039 |
| Germany | -.10839 | -.12428 |
| Italy | 1.08624 | -.16816 |
| The Netherlands | .07678 | .05104 |
| The United States | -.18427 | -.08944 |

Exhibit 7 presents a graphic depiction of rotated orthogonal factors. The following aspects of this graphical rendition (of the terminal solution) should be noted:

1. The variables' (data points') relative distance from the two axes;
2. The countries' (variables') direction relative to the axes (i.e., positive or negative); and
3. The relative position of the country (variable) clusters to each other or the actual correlation between the subportfolios (factors). This indicates the degree to which the orthogonality assumption has been met.

Exhibit 7 indicates that virtually all factor loadings are positive because the rotation (orthogonal) of axes has positioned the data in the positive quadrant near one axis or the other. Rotation of axes is, therefore, easier to understand than those (factor loadings)

Exhibit 7. Two-dimensional Plot of Rotated Orthogonal-Factor Matrix of Two Subportfolios and Associated Countries



x = factor 1 loadings

y = factor 2 loadings

1 = Belgium

2 = France

3 = Germany

4 = Italy

5 = The Netherlands

6 = The United States

not rotated. Another important aspect to the rotation (of axes), in addition to simplicity, is that such solutions have a higher degree of stability. The reason is that removal of irrelevant (or immaterial) factor loadings from the rotated terminal solution results in substantially less dimensional change than if they had been excluded (the immaterial loadings) from the unrotated initial solution. Thus, this rotated solution is more stable, especially when one has removed immaterial data (variables). Stephenson notes that the stability factor, as a consequence of data withdrawal (in subsequent studies) and its effect on future works, is an important issue.⁴⁵

Exhibit 3 presented the relationship between subportfolio (factor) 1 (horizontal) and subportfolio (factor) 2 (vertical). Notice that there are no variables in close proximity to the origin; thus, no factors have small loadings on both factors. The cluster of variables 2, 3, and 5 (France, Germany, and the Netherlands) load moderately high on subportfolio (factor) 1, while variable 4 (Italy) has the highest loading on this same factor (1). These same variables (2, 3, and 5) are found to load moderately low on subportfolio (factor) 2 with the exception again being variable 4, where it loads very low.

The country cluster of Belgium and the United States (variables 1 and 6) are seen to load substantially high on factor 2 while both (variables) load low on factor 1.

Notice that the graphic presentation in Exhibit 1 separates the clusters of factor 1 (France, Germany, Italy, and the Netherlands) and that of factor 2 (Belgium and the United States). A 90° separation between these two clusters would represent orthogonality (or uncorrelation). However, the two country clusters that have been identified are separated somewhere between 45° and 60°. Thus, some correlation exists across clusters. That is, the respective countries in one group (cluster) correlate in varying degrees to the countries in another group. By separating the individual components (countries) respective to each cluster, one can illustrate a hypothetical construct of lowest correlation. For simplicity, the following assumptions are made: (1) only two countries are used (i.e., securities from these two countries); and (2) the two-country portfolio is equally weighted.⁴⁶

⁴⁵ W. Stephenson, *The Study of Behavior* (Chicago: University of Chicago Press, 1953).

⁴⁶ In a realistic situation, a portfolio would be more heavily weighted in some securities (in this case the securities would be representative of a country) than others. This would imply additional mathematics needed to measure the risk-return acquired by each new addition to the portfolio.

Using the criteria formerly stated, the most uncorrelated two-country portfolios would be those of the United States and Italy. Note that although Italy is part of cluster 1, it is farther from another country than any of the other countries (in the cluster). These two data points (United States and Italy) are extremely close to a 90° separation, thus indicating almost no correlation between them. It should be emphasized that this was only an example; however, it demonstrates how helpful the graphic representation can be. In addition, although the correlation between the two clusters as a whole appears to be very low, modification of model parameters in subsequent studies may change all of this. Future studies may find it necessary to investigate the correlation itself, especially where even a small degree of correlation is undesirable. Although it is beyond the present discussion, correlation may be studied via an oblique (correlated) rotational method. The need is not so apparent here, since the method is to resolve conflicts arising from complex variables loading significantly on more than one factor subsequent to rotation.⁴⁷

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The present study reviews intercountry correlations of five Common Market countries and the United States. The hypothesis of potential variable (country) redundancy, as well as conceptual overlap occurring thereof, was formulated. The null hypothesis was subsequently rejected in favor of the alternate hypothesis. The conclusion was that the initial six countries (variables) were indeed redundant and were subsequently replaced by the two (less redundant) subportfolios (factors). The two subportfolios (factors) which evolved from the rotated terminal solution were attributed names according to their (factor's) highest loading countries (variables). Thus, the principal-component model in combination with the factor-estimates gives rise to a linear model for the measurement and evaluation of the factors of intercountry correlation.

One of the major points of this paper is that initially the decision maker has an excessive amount of information with which to deal. This original (redundant) information was transformed into a much more concise format, alleviating some of the interpretative problems inherent in the raw data. This more concise form is presented by the low-redundancy variables (the two subportfolios). Thereby,

⁴⁷ R. J. Rummel, "Understanding Factor Analysis," *Conflict Resolution* (Spring 1967), 444-80; and *Applied Factor Analysis* (Evanston: Northwestern University Press, 1970).

these (two) subportfolios (factors) can be incorporated into a quantitatively structured model. Resources expended along various stages of the research processes will, as a result, be more efficiently employed in the newer and more succinct model. The capacity to save time in collecting and processing data, as well as the ultimate judgment at the conclusion of the decision process, should become increasingly evident with use of the new (less redundant) model. An example of such a decision would include the construction of a portfolio of international securities where the delineation of investment outlets is a function of country correlations. This presupposes that the respective countries (correlations) in the opportunity set are representative of their internal security market movements from which the country correlations are derived. Another decision made more efficient might entail the establishment of hypotheses concerning interrelated country correlations (i.e., high intercountry correlation) to economic phenomena.

This study implied that subsequent research may be expedited more efficiently through these two subportfolios (Italy, France, Germany, the Netherlands, Belgium, and the United States) rather than through the six countries on an individual and intercountry basis.⁴⁸ These relationships are clearer to the reader due to the graphic depiction. The six original variables (countries) that were notably redundant may be regenerated into the two factors by the principal-component model.

⁴⁸ The status of France is questionable as a member of the European Common Market at present with the newly elected socialist regime now firmly in power. This is one of the major problem areas, not only for diversification reasons but for direct investments as well. Political consequences throughout the world are among those factors that by and large cannot be predicted. Although methods have been devised to consider political and economic risk, Shapiro notes that an obvious weakness is an evaluation of a particular risk's real effect on investment returns. See A. C. Shapiro, "Capital Budgeting for the Multinational Corporation," *Financial Management* (Spring 1978), 7-16.

Cost Allocation in Management and Financial Accounting

R. C. SKINNER*

Cost allocation has for many years been a controversial issue in both management and financial accounting. The most commonly held viewpoint on the matter at present among academics appears to be that, while cost allocation is very common in practice, its existence is very difficult, if not impossible, to justify. The following are three representative statements on the subject:

Few topics in accounting are as thoroughly condemned in theory, and as pervasively manifest in practice, as cost allocation. Throughout the literature of accounting and economic theory, the contention is frequently made that the allocation of costs is inherently arbitrary and hence serves no useful purpose. . . .¹

Accountants have long been concerned with whether, and how, indirect costs should be allocated. The prevalent view among many accounting researchers is that such cost allocations are essentially arbitrary and serve no useful purpose.²

. . . most textbook authors disclaim that allocations have any usefulness. . . .³

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¹ R. E. Verrecchia, "An Analysis of Two Cost Allocation Cases," *Accounting Review* (July 1982), 579.

² G. A. Blanchard and C. W. Chow, "Allocating Indirect Costs for Improved Management Performance," *Management Accounting* (USA) (March 1983), 38.

³ As noted in the text, Moriarity uses the term "joint cost" to include common costs. See S. Moriarity, ed., *Joint Cost Allocations* (Norman, Okla.: University of Oklahoma, 1981), 8.

The best known critic of cost allocation is Thomas,⁴ although his criticisms are by no means the only ones. His arguments have never been refuted. The most frequently quoted attempt to refute them, by Eckel, is a very weak one.⁵ On the issue of incorrigibility, as Thomas noted in his reply,⁶ Eckel seriously misinterpreted Thomas's concept. On the topic of arbitrariness, Eckel virtually conceded defeat, saying that Thomas "is justified in concluding that as the objective of allocating — the measurement of accounting income — is defined now, accounting's allocations are arbitrary."⁷

The most frequently quoted defense of allocation, that by Zimmerman,⁸ although certainly valid, is not (in this author's opinion) a particularly strong case, and none of his arguments is directed at Thomas. Zimmerman's arguments are reviewed here. Game theory approaches to cost allocation are not discussed here. A good review appears in Biddle and Steinberg.⁹ Most accountants probably share the skepticism expressed by Dopuch as to the applicability of such approaches.¹⁰

The purpose of this paper is to present the positive arguments, some familiar and some original, in favor of cost allocation in management and financial accounting, and to present some original arguments opposing Thomas's position. Part of the difficulty in justifying cost allocation lies, this author believes, in two definitional issues. These are the distinction between common and joint costs, and the meaning of the word *arbitrary*; these issues are discussed briefly first.

JOINT COSTS

A direct cost is one that can be identified with a specific cost center or cost unit, whereas an indirect cost is one that is common to two or more cost centers or cost units, so that the cost may be

⁴ See particularly A. L. Thomas, *The Allocation Problem: Part Two*, Studies in Accounting Research No. 9 (Sarasota, Fla.: American Accounting Association, 1974); and *A Behavioral Analysis of Joint-Cost Allocation and Transfer Pricing* (Champaign, Ill.: Stipes, 1980).

⁵ L. G. Eckel, "Arbitrary and Incorrigible Allocations," *Accounting Review* (October 1976), 764-77.

⁶ A. L. Thomas, "Arbitrary and Incorrigible Allocations: A Comment," *Accounting Review* (January 1978), 263-69.

⁷ Eckel, "Arbitrary and Incorrigible Allocations," 775.

⁸ J. L. Zimmerman, "The Costs and Benefits of Allocation," *Accounting Review* (July 1979), 504-21.

⁹ G. C. Biddle and R. Steinberg, "Allocations of Joint and Common Costs," *Journal of Accounting Literature* (1984), 1-45.

¹⁰ In Moriarity, *Joint Cost Allocation*, 4.

averaged between them. A joint cost, as the term is most commonly used, is a particular type of common cost, namely, the cost to the split-off point of products that must be produced together. All joint costs are common, but the converse is not true: most products are independent of each other to a greater or lesser extent. The accounting texts are unanimous in their view that no management accounting purpose is served by the allocation of joint costs. Most texts are clearly not particularly happy with the use of such costs to value inventories for external reporting purposes. The only alternative basis of valuation that has been suggested, however, is net realizable value, which would involve contravening the realization principle.

Biddle and Steinberg propose an alternative definition of joint cost taken from the economics literature.¹¹ They make no attempt to explain, however, why the economics definition is preferred. The advantage of the traditional accounting concept based on physical dependence is that it is clear from the definition why the allocation of joint cost should serve no management accounting purpose; on the other hand, the accounting definition leaves an open question as to whether allocations of other types of common cost are useful to managers.

Some writers, such as Moriarity,¹² use the term "joint" loosely, where no joint products are involved. Other writers, particularly Thomas, clearly regard "common" and "joint" as being synonymous.¹³ Thus, they employ the well recognized uselessness of joint cost allocation for management accounting purposes to help cast doubt on the usefulness of allocating common costs between independent products, where the situation is quite different. Such writers simply blur the distinction rather than face the issue squarely. They would presumably argue that, from the viewpoint of managerial decision making, there is no essential difference between a quarter share of a joint cost allocated to a joint product and, for example, a quarter share of a chief executive's salary allocated to a division. Just as it is not possible to eliminate only one of a set of joint products, so chief executives usually have the economic power to prevent their salaries being reduced. But while the first reduction is physically impossible, the second is not. Chief

¹¹ Biddle and Steinberg, "Allocations of Joint and Common Costs," 4-5.

¹² Moriarity, *Joint Cost Allocations*.

¹³ Thomas very seldom uses the term "common." In situations where the word should be used, he almost invariably uses the term "joint."

executives' salary reductions, although not common, do occur, a well-publicized case being that of the president of the Chrysler Corporation.

ARBITRARINESS

The word "arbitrary" is frequently used in discussions of cost allocation. Thomas attaches a meaning to the term which is quite different from its everyday meaning: for him, arbitrary means "not theoretically justifiable,"¹⁴ meaning that a particular method of allocating a cost cannot be conclusively shown to be superior to alternative methods. Thomas is almost alone in supplying a definition. If the word is used without being defined, it must bear its everyday meaning; its most usual synonym is "capricious." In the first two quotations at the beginning of this paper, the word is obviously being used in its everyday sense since, for Thomas, arbitrariness does not necessarily imply uselessness. Consider the situation where one person is the legal tenant of an apartment but shares it with several other people; the rent of the apartment must be apportioned between them.¹⁵ The rent could be divided in a number of arbitrary ways, such as in proportion to the heights or the shoe sizes of the residents. A number of non-arbitrary ways exist, such as in proportion to the incomes of the residents, or in proportion to the floor areas of their bedrooms. The term "arbitrary" in its everyday sense implies that the allocation is based on no criterion at all, so that it is at the whim of the allocator, or that it is based on an irrelevant criterion, as with the allocation of rent in proportion to shoe size. In the everyday sense of the word, very few allocations in accounting are arbitrary.

For Thomas, however, allocation of the rent according to income or floor area would also be arbitrary if, as is likely, there is serious doubt about which basis is best. If his criterion of lack of theoretical justification were valid for cost allocations in accounting, it would indeed be a serious defect. His criterion, however, is not valid.

The management accounting texts are virtually unanimous that costs should be allocated according to the factors which cause them. The relevance of the causal criterion to the control and evaluation of performance and for managerial decision making is reasonably clear. Cost control and decision making are likely to be aided if the cause of a cost is known, and if the cost is reported

¹⁴ Thomas, *The Allocation Problem: Part Two*.

¹⁵ Thomas considers a similar situation, but unfortunately, he merely caricatures it. *Ibid.*, 56.

to the person who has a significant degree of influence over the cause, or who can make decisions relating to the cause (this point is elaborated in the next section). In financial accounting, the choice of a depreciation method should reflect the main factor which over time causes an asset to lose its service potential. The causal criterion is not always easy to use, particularly for the allocation of fixed costs to cost centers, or where, as is usually the case with depreciation, there is typically more than one causal factor. The fact that the criterion is being used should be, in itself, sufficient evidence against a charge of arbitrariness (in both the everyday sense and in Thomas's meaning). The difficulties with the causal criterion are empirical, not theoretical.¹⁶

USES

In this section, the arguments for and against the allocation of common costs are reviewed. There is no reason to doubt the statement by Moriarity at the beginning of this paper that most textbooks contain a general disclaimer as to the usefulness of allocation. It is also true, however, that when they discuss specific uses of particular allocations of variable costs, the texts indicate that the general disclaimer is not to be taken seriously.

In fact, virtually no controversy exists in the management accounting literature as to the usefulness of allocating variable common costs. When cost-volume-profit analysis is discussed in the texts, its limitations are noted, but those limitations do not include the fact that some variable costs are indirect to product units. When short-run incremental cost is to be estimated, all costs, direct and indirect, which vary with the factor that is to be changed (for example, the volume of output) are relevant. Information as to the variable costs of common services, such as power supply, will be useful to the supervisors of the user departments to enable them to decide, for example, whether an increase in material wastage in exchange for a reduction in power usage would be justified. Kaplan, and Capettini and Salamon have shown that the usefulness of such common variable costs for decision making extends to cases where they have been allocated on a reciprocal basis between service departments.¹⁷ When the management ac-

¹⁶ Further criticisms of Thomas's criterion of theoretical defensibility appear in the subsequent section in the text concerning Thomas's arguments.

¹⁷ R. S. Kaplan, "Variable and Self-Service Costs in Reciprocal Allocation Models," *Accounting Review* (October 1973), 738-48; and R. Capettini and G. L. Salamon, "Internal versus External Acquisition of Service when Reciprocal Services Exist," *Accounting Review* (July 1977), 690-96.

counting texts discuss the analysis of overhead cost variances in standard costing, they invariably express doubt as to the usefulness of volume variances on fixed overhead, but no significant limitations are recognized relating to spending and efficiency variances on variable overhead.

To make the textbook attitude to the allocation of variable overhead for control purposes fully acceptable, however, an intermediate stage between controllability and uncontrollability should be recognized.¹⁸ Consider a power unit in a factory that supplies power (electricity, or steam, or compressed air) to production departments. A significant part of the costs of the power will be variable, primarily the cost of the fuel used (oil, gas, or coal). The efficiency of generation of the power will be controlled by the supervisor of the power house; the efficiency of its use will be controlled by the supervisors of the production departments. It is suggested that a useful term for that intermediate degree of control that each type of manager exerts over the variable costs of the firm's power supply is "influencable." That degree of control will usually make it helpful to allocate the variable cost of power to a production department so that its manager can, for example, determine the amount of money the company would save if that department used power more economically. Similar arguments can be used for service departments of all types, provided that some of their costs are variable.

Controversy over cost allocation in management accounting revolves almost exclusively around fixed costs. Indirectness itself is not a problem, but indirectness combined with fixity is. The management accounting textbooks take a fairly uniform attitude of opposition to the allocation of fixed common costs. For cost control purposes, the consensus viewpoint seems to be that fixed costs can be controlled only in the cost centers in which they are incurred, not in those to which they may be allocated. For short-run decision making, fixed costs are, of course, irrelevant; for long-run decision making, the consensus viewpoint seems to be that fully allocated fixed costs are likely to provide very poor estimates of long-run incremental costs. Although these views are probably those of the majority of management accountants, an

¹⁸ McNally suggests the recognition of several intermediate steps. To do so, however, would probably result in a conceptual model whose complexity is severe enough to inhibit seriously its usefulness. See G. M. McNally, "Responsibility Accounting and Organizational Control: Some Perspectives and Prospects," *Journal of Business Finance and Accounting* (Summer 1980), 165-81.

impressive body of opinion exists on the other side of the controversy. Decision making is discussed first, followed by cost control.

In a famous article, Dixon argued that allocated full cost is likely to be the best available estimate of the long-run incremental cost of any permanent additional activity.¹⁹ Although he certainly does not say so, he presumably believes that the reverse is also true, namely, that allocated full costs are the best available estimates of the long-run cost savings of permanent *reductions* in activity. An explanation of Dixon's viewpoint is that rational businesses operate in the long run at balanced full capacity; any permanent increase in activity is likely to be accompanied by a proportionate increase in all fixed costs. Zimmerman makes a similar point, namely, that cost allocations can act as useful and inexpensive proxies for a number of hard-to-observe costs, including the costs of expanding services.²⁰ An elaboration of Zimmerman's viewpoint is that a regular increase in the use of a service (which is likely to be encouraged by charging for the service on a variable cost basis) is likely to lead to an expansion of the service, and therefore an increase in its fixed costs. Dixon's viewpoint is not just a theoretical possibility: in the survey by Fremgen and Liao, a decision-analysis purpose quoted by 49 percent of those who allocated was that "current indirect cost allocation amounts are considered to be the best available approximations of expected actual increases in indirect cost categories."²¹

In an earlier survey of practice by Baumes, a different decision-analysis use of allocated fixed cost data was discovered, namely, that allocation of the cost of a service often leads to questioning the internal provision of the service or the level at which it is supplied, relative to its provision (partly or fully) from outside the business.²² Certainly, this use of allocations ought not to be necessary: in a perfect world, such matters as the internal versus external provision of services would be reviewed at least once a year, but perfection no more exists in business than it does in any other real-world activity.

So far as the evaluation and control of performance are concerned, the survey by Baumes indicated that a common consequence of allocating service department fixed costs to the users of

¹⁹ R. L. Dixon, "Creep," *Journal of Accountancy* (July 1953), 48-55.

²⁰ Zimmerman, "Costs and Benefits of Allocation."

²¹ J. M. Fremgen and S. S. Liao, *The Allocation of Corporate Indirect Costs* (New York: National Association of Accountants, 1981), 68.

²² C. G. Baumes, *Allocating Corporate Expenses*, Business Policy Study No. 108 (New York: National Industrial Conference Board, 1963), 8, 34, 70.

the services was to encourage service department managers to do a better job of controlling their costs.²³ Fremgen and Liao reported a similar finding: one of the performance-evaluation purposes quoted by 46 percent of those who allocated was to "stimulate profit center managers to put pressure on central managers to control service costs."²⁴ Such a reason for allocation is likely to appear bizarre to anyone who believes that influence works in only one direction, from a superior to a subordinate, and that a cost is either fully controllable by a particular manager or completely uncontrollable. Such a reason will not appear strange to anyone who recognizes that influence can operate in both directions, and that controllability is likely to represent a spectrum, if not a continuum. According to McNally, a majority of the studies of responsibility accounting "recognize degrees of control along a continuum."²⁵ A somewhat similar reason for allocating suggested by Zimmerman is that cost allocation can induce a subordinate to act as a monitor of the superior, but only insofar as the superior's consumption of prerequisites is concerned.²⁶ This viewpoint is derived from agency theory, about which little empirical evidence as yet exists.

The survey of divisional performance measurement by Reece and Cool supplies support for the allocation of common fixed costs. Almost all of their respondents claimed to use either profit centers or investment centers. That finding, it is true, is somewhat misleading. The article states that 29 percent (173) of those who claimed to use such centers (594 companies) did not allocate corporate administrative expenses to the centers.²⁷ Those companies, therefore, clearly did not compute divisional profit, but only some type of divisional contribution margin. If such companies were eliminated, however, it would still leave over 70 percent that allocated all common fixed costs to their divisions.

The proportion in the Vancil survey which did not allocate the costs of central administration ("top corporate overhead") was

²³ Ibid.

²⁴ In that survey, those respondents who allocated each gave, on average, approximately two decision-analysis reasons for doing so and approximately three performance-evaluation reasons. See Fremgen and Liao, *Allocation of Corporate Indirect Costs*, 61.

²⁵ McNally, "Responsibility Accounting," 170.

²⁶ This effect is additional to that by which allocations can encourage the subordinates to reduce their own consumption of perquisites.

²⁷ J. S. Reece and W. R. Cool, "Measuring Investment Centre Performance," *Harvard Business Review* (May-June 1978), 36.

even higher, at 37 percent.²⁸ The proportion with genuine, rather than merely nominal, profit centers is, however, at 63 percent, still substantial. Both surveys, unfortunately, tell virtually nothing as to how profitability data for divisions are used. It can, therefore, be only a presumption that the information generated is, in fact, useful. That presumption is justified if the data are used primarily for interfirm comparisons, that is, comparing the results of a division with those of outside companies or with divisions in other companies.

Interfirm comparisons help to overcome the limitations of comparisons only with budgets: although budgets can be highly objective, they are inevitably subjective on such matters as market share and the appropriate levels of expenditure on advertising, research and development, and in most areas of administration. Interfirm comparisons cannot, however, be based on contribution margins. The omission of major items of fixed cost and invested capital from financial results is likely to destroy any comparability there may be between different firms, and the omitted items may be the main areas where differences exist between the firms. A hint as to the plausibility of this explanation is provided by Fremgen and Liao: they interviewed only about 7 percent of their respondents, but they reported among those a sentiment that "since independent companies must incur corporate expenses, operating divisions should be charged proportionate shares of indirect corporate costs so that comparisons with independent companies can be made."²⁹

Interfirm comparison, however, appears not to be used sufficiently widely to provide more than (at most) a partial explanation of the popularity of profit (or investment) centers within large corporations. The only other plausible explanations are those discussed previously, namely, that fully allocated cost is likely to be the best available estimate of long-run incremental cost, and that, with controllability being best represented by a spectrum, virtually any financial aspect of a business is likely to be subject to some degree of influence by top management.

The implications to be drawn from this analysis are, it is suggested, the following. Very little, if any, criticism can be leveled against the allocation of common variable costs. The allocation of some common fixed costs in some companies is almost certainly useful for some management accounting purposes. Conceding that

²⁸ R. F. Vancil, *Decentralization: Managerial Ambiguity by Design* (Homewood, Ill.: Dow Jones-Irwin, 1979), 252.

²⁹ Fremgen and Liao, *Allocation of Corporate Indirect Costs*, 43.

much implies that no blanket condemnation of common cost allocation (as opposed to joint cost allocation) in management accounting can be justified.

PROBLEMS WITH CASH FLOWS

Arguments against cost allocation can be evaluated not only in the way used earlier, but also by examining what is suggested to replace it. Cash flow accounting (that is, the recording and reporting of past cash flows) is believed by some of its proponents to be an allocation-free alternative to conventional accounting. Thomas believed so at the time of his second book but by the time of his third book, he realized that that is not so.³⁰ Complex organizations often need to be divisionalized so that they can be managed properly. Sometimes no external market prices exist for goods transferred between divisions, and in those cases, the transfer prices are often based on cost. Such prices represent an allocation of cost from one division to another. Cash flows between divisions, therefore, insofar as they are based on transfer prices of that kind, are affected directly by cost allocations. This point has been restated and elaborated by Rutherford.³¹

The cash inflows of whole companies will also sometimes be directly affected by cost allocations. Surveys of pricing methods have repeatedly shown that 70 to 80 percent of firms use cost-plus pricing. In some cases, it is gross margin (i.e., direct cost) pricing, which requires no allocation of common costs, but in other cases it is variable costs (i.e., contribution margin) pricing, which requires the allocation of variable common costs, and in other cases it is full cost plus, which requires the allocation also of fixed common costs. An important finding in the survey by Skinner is that most cost-plus pricers (68 percent in that survey) use flexible mark-ups on cost, the mark-ups being varied according to estimates of market forces;³² prices as finally determined will, therefore, sometimes retain little, if any, connection with cost data. In other cases, however, prices will be directly affected by costs, and, where the pricing method used is full cost plus, the cash inflows of the company will be dependent on the allocation of both fixed and variable common costs. No doubt some academics would argue

³⁰ Thomas, *The Allocation Problem: Part Two and Behavioral Analysis of Joint-Cost Allocation*, respectively.

³¹ B. A. Rutherford, "The Interpretation of Cash Flow Reports and the Other Allocation Problem," *Abacus* (June 1982), 40-49.

³² R. C. Skinner, "The Determination of Selling Prices," *Journal of Industrial Economics* (July 1970), 201-17.

that business decision makers are foolish ever to use cost plus. That may be true, but an alternative explanation is possible. Cost-plus pricing appears to be as popular as it ever was, despite the criticisms of innumerable academics over many years: it is likely, therefore, that academics have not yet understood fully the role of cost in the determination of selling prices.

There are, in short, no allocation-free alternatives to traditional accounting. That fact does not, of course, prove that traditional accounting is beyond criticism. It does mean, however, that those who oppose traditional accounting have no alternative to offer that does not suffer from the same defects. They must explain how the purposes achieved by conventional accounting are to be achieved in its absence.

Capital investment decision making using forecast cash flow data has also traditionally been regarded as being free from allocations, on the grounds that it ought to be based on incremental cash flows. In recent years, however, severe doubts have arisen about the wisdom of using incremental data. Burrows has noted that, if a firm aims for the same target rate of return on a number of projects (and achieves it, so far as incremental cash flows are concerned), but it ignores in its calculations costs that are common to the projects, the firm will not achieve its target rate over all its projects.³³ Some costs, particularly those of administration, are common to all, or to many, of a firm's investment projects. When a project ends and is either renewed or replaced by another, administrative staff are not discharged and then re-engaged; their salaries and related costs are not part of the incremental cash flows of individual projects. Burrows suggests the allocation of the common costs to the projects.

There is (as far as this author knows) only one published description of how the problem discussed by Burrows³⁴ is handled in an actual business, and the approach adopted there was allocation, of both common costs and common capital investment. J. W. Bennett, financial director of Unilever Australia, has written that, in his company, "the pure cash concept is usually modified to take account of items common to the overall business, e.g., for a share of indirect expenses and back-up capital."³⁵

Another aspect of replacement decision making also possibly

³³ G. H. Burrows, "Incremental Flows in Project Evaluation," *Accounting and Business Research* (Summer 1982), 188-92.

³⁴ *Ibid.*

³⁵ J. W. Bennett, "Capital Expenditure Evaluation in a Multinational Business," *Australian Accountant* (November 1981), 673-75.

(but only possibly) involves allocation. Allocation is merely an averaging process: for example, straight-line depreciation involves simple arithmetic means, production-hour depreciation involves weighted arithmetic means (as do most allocations in management accounting), and reducing-balance depreciation involves geometric means. The difficulty in question involves the techniques used, in situations where cash flows are not constant each year, for computing the economic lives of assets, comparing projects of unequal lives, and determining the optimum time to effect replacement. The techniques are well described by Levy and Sarnat.³⁶ The most common method is to convert present values into equivalent annuities, and then to compare the annuities. This approach involves averaging, using geometric means, and (this author would argue) clearly involves the allocation of cash flows to time periods. An alternative approach that is often recommended is to use the lowest common multiple of the lives of alternative investments, but this method (apart from being typically very time consuming) is theoretically objectionable, because it cannot be used for replacement timing decisions. For example, suppose that the economic life of the best available replacement investment has been determined to be five years, and it must be decided whether the replacement should occur now or be postponed for a year. The time series involved are then (in years): 5, 5, 5, and so on; 1, 5, 5, and so on; there are no lowest common multiples of such time series.

A different approach to comparing projects over the same time period is to compare them over infinity. This method involves computing the net present value of a project of a particular life, and then converting that value into the present value of a perpetuity, assuming endless repetitions of the project; optimum replacement timing involves computing the present value of a deferred perpetuity. Because infinity is not a realistic planning period, this approach must be considered an even more artificial device than the equivalent annuity approach. It is, admittedly, not an allocation method — in fact, it is the reverse. It would be difficult, however, for a critic of allocation to justify accepting the perpetuity approach, based on combining the results of endless repetitions of a project, but rejecting the equivalent annuity approach, solely because the latter involves assessing the results of a project part of the way through its life. Both methods, of course, will always lead to the same investment decisions being made.

³⁶ H. Levy and M. Sarnat, *Capital Investment and Financial Decisions*, 2nd ed. (Englewood Cliffs, N. J.: Prentice-Hall, 1982), 105–9.

THOMAS'S ARGUMENTS

The severest critic of cost allocation is Thomas. Detailed consideration of his arguments has been postponed to this stage because it is not clear to what extent his arguments apply, or are intended to apply, to management accounting, apart from the allocation of joint costs to joint products. He has conceded³⁷ that data involving allocated costs can affect the behavior of those who use them, and those effects can often be helpful in achieving the objectives of the business. It could be argued that, in that case, no further justification for cost allocation is necessary. Thomas has, however, compared belief in cost allocation to such irrational matters as belief in witches,³⁸ which does not suggest an acceptance of that type of justification. This lack of acceptance by him is probably due to the fact that an allocation can be effective, and even beneficial, and can still be subject to his two major criticisms of allocation.

Thomas's primary objection is that allocation statements are "incurrigible," meaning not empirically testable. This is because such statements do not describe events or states of the real world. His other major criticism is that allocations are not theoretically justifiable, meaning that a particular method of allocating a cost cannot be conclusively shown to be superior to alternative methods. These arguments are quite general and ought to apply as much to allocations between cost centers or cost units (the usual cost objects in management accounting) as to allocations to time periods (the typical cost object of financial accounting). If they are intended to apply to management accounting, and if the case presented in this paper is valid, the arguments are not correct. It is a matter for empirical testing whether or not a particular allocation provides a good estimate of incremental cost, and whether or not it provides data that are useful for cost control. It can be empirically tested whether one method of allocating is superior to others, for either decision-making or control purposes, and, given evidence on the matter, that method will be defensible against alternatives.

Irrespective of whether management accounting cost allocations pass Thomas's tests, whether the criteria themselves are valid is a matter of serious doubt. Allocation is, as noted previously, only an averaging procedure, most often involving arithmetic means. That they often do not correspond with states or events of the real

³⁷ Thomas, *The Allocation Problem* and, particularly, *A Behavioral Analysis of Joint-Cost Allocation: Part Two*.

³⁸ Thomas, *The Allocation Problem: Part Two*.

world is a well recognized feature of arithmetic means: the mean height of a group of people is most unlikely to correspond with the height of any individual, and the more precisely the mean is computed, the less likely is it that any person of that height will exist. Geometric and harmonic means share that characteristic of arithmetic means, although medians and modes do not; that characteristic is not usually taken as implying that medians and modes are the only legitimate types of average. The only kind of empirical testing of averages that is possible is to check the measurements and the calculations; this type of testing can be done with cost allocations, but that fact would presumably not make them acceptable to Thomas.

For some purposes, it is very difficult to choose between the use of an arithmetic mean, a median, and a mode, and for other purposes, between an arithmetic mean, a harmonic mean, and a geometric mean. Where weighted averages are concerned, in a number of areas in statistics (e.g., price indices), it is not possible to prove that one type of weighting system is superior to others, or that one set of weights within a system is the only defensible one. One or another of Thomas's criteria would rule out the use of most averages, irrespective of context or purpose. The only justification of averaging is that it is useful. It is suggested that this is the only reasonable justification of cost allocation.

There are two widely held views as to the nature of accounting. One has been labeled the "true income" approach: this viewpoint involves the selection of an ideal, usually that of economic income, and the evaluation of actual accounting procedures by how closely they conform with the ideal. Under this viewpoint, accounting is a pure science, like physics or economics. The other viewpoint is the utilitarian approach, whereby the only justification for any accounting procedure is usefulness in helping people to achieve their objectives. Under this approach, accounting is a type of technology, like engineering or general medicine. Although it involves speculation, since Thomas does not discuss these viewpoints, this author believes that he is an adherent of the former view. He admits the need to assess the performance of a business over the course of a year, but to do so, he requires that that time period should be completely independent of all other time periods — a manifest impossibility. He concedes the case for assessing the performance of individual segments of a business, but requires that they not interact with each other — equally an impossibility. All that is necessary, it is suggested here, is that there should be

sufficient independence to make possible useful accounting data; this author believes that sufficient independence does exist except where joint products are involved.

FINANCIAL ACCOUNTING

So far as financial accounting is concerned, this paper does not offer anything radical, either in the way of new methods for accrual accounting, or new interpretations of existing methods. The paper would, indeed, lack credibility if it relied on proposals for radical change. Accrual accounting has been described as normalized cash flow accounting. The ways in which the normalization (that is, averaging) is performed are very familiar, involving the principles (or concepts) of realization, matching, objectivity, and so on. What is required is the justification of financial accounting as it has been understood and practiced over many decades.

One way of justifying cost allocation in financial accounting is by reference to management accounting. If the arguments in this paper are correct, cost allocation is acceptable in management accounting. The general purposes for which data are used are not, this author believes, essentially different in management and financial accounting. There are, of course, some legal constraints on data: these relate, in particular, to income tax for financial accounting, and to government contracts in management accounting. Apart from these areas, however, the basic purposes are very much the same. Users will wish to know whether the accounting entity in which they have an interest is performing satisfactorily, and to decide whether to become involved with the entity.

The difference between what are often called external reporting and internal reporting lies in the range of actions open to a user of accounting reports. If a small shareholder, or the typical employee, or a creditor comes to believe that the efficiency of a business needs improvement, there is relatively little he or she can do about such beliefs, compared with the range of actions open to a member of top management. Even a major shareholder (who is not a director) can usually only influence the business indirectly, through top management. The difference lies not in the uses which outsiders and insiders make of their data but in the types of action they are able to take. The most commonly quoted distinguishing features of management accounting are that managers, far more often than outsiders, need to take action on the basis of their accounting reports, and, as a result, they need far more detailed information, more promptly and frequently.

Profitability and solvency are of as much interest to managers as to shareholders and creditors: the use of financial accounting ratios, for both interfirm comparison and for investment analysis, is evidence of that shared interest. The fact that some types of accounting information, such as the division of costs into variable and fixed elements, and budget data, are used only by management is not evidence that outsiders do not wish to use them but is due to the fact that they do not have access to them. The two groups have, however, come somewhat closer together in recent years, particularly in the supply of segmental data to outsiders, and the use of return-on-investment ratios for appraising divisional performance. The utility of the former type of data is more intuitively obvious than that of the latter. The use of broad-ranging financial data by management remains to be thoroughly investigated: a possible explanation of their utility, related to incremental cost estimates and controllability, was given earlier.

The second way to justify traditional financial accounting is to cite the empirical evidence relating to its usefulness. Despite the efforts that have been devoted to empirical research in recent years, the evidence is still not extensive. For example, it is widely believed that conservatism (or prudence) is an influential accounting principle, but there is very little reliable evidence to support that belief, and even less to indicate why it is influential. The empirical evidence available on financial accounting is summarized in Foster.³⁹ Some of the evidence can be dismissed by skeptics. For example, positive evidence relating to the prediction of credit ratings can be argued to be evidence that accounting ratios are used to make such ratings, but not that they ought to be used; their use could be due solely to tradition. The best evidence is probably that relating to the use of multivariate discriminant analysis based on accounting ratios to predict business failures.⁴⁰ This area has now been quite well explored, and the evidence has shown accrual accounting data to be very useful. Evidence on other issues is, of course, desirable: in the meantime, however, it is suggested that the appropriate attitude to accrual accounting is that its survival over many decades and the empirical evidence available together constitute a reasonably good case for its usefulness.

³⁹ G. Foster, *Financial Statement Analysis* (Englewood-Cliffs, N. J.: Prentice-Hall, 1978), chaps. 13, 14, and 15.

⁴⁰ *Ibid.*, chap. 14.

CONCLUSION

This author suggests that we are now in the same situation concerning cost allocation as we once were in relation to the payback method in capital budgeting. That method was at one time condemned on the basis of an illegitimate criterion, namely, that it is an unacceptable way to allow for the time value of money. Understanding the method improved when it came to be realized that the method is more likely to be a way of allowing for uncertainty. The time has come, it is suggested, to abandon blanket condemnation of cost allocation in accounting. Academic accountants should seek evidence and understanding, not adopt hasty attitudes of disapproval.

An Analysis of the Feasibility of Harmonizing Financial Reporting Practices between Member Countries of the EEC and the OECD

THOMAS J. PURCELL, III, and JAMES P. SCOTT*

According to Nobes and Parker,¹ harmonization is "a process of increasing the compatibility of accounting practices by setting bounds to their degree of variation." In recent years, the concept of harmonization has been chiefly applied in the context of international accounting. This application can be seen in efforts to increase the comparability of financial statements issued by companies with reporting responsibilities to different countries. The impact is especially important when dealing with a multinational company which has reporting responsibilities to more than one country.

Previous studies in this area have chiefly dealt with the accounting system impact of harmonization. For example, Nair and Frank² analyzed the impact of both disclosure and measurement practices on the feasibility of the harmonization process by classifying countries according to their procedures in those two areas.

One aspect of reporting process is the impact that a particular country's tax system has on the procedures used to report financial income. In an international context, as will be developed more fully later in this article, tax systems vary from those requiring

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¹ C. W. Nobes and R. H. Parker, eds., *Comparative International Accounting* (Homewood, Ill.: Richard D. Irwin, 1981), 329.

² R. D. Nair and Werner G. Frank, "The Impact of Disclosure in Measurement Practices on International Accounting Classifications," *Accounting Review* (July 1980), 426-50.

complete conformity of financial information with tax information to those requiring little or no conformity.

If harmonization of reporting practices is a desirable goal, it would seem that some analysis of the impact of the tax system requirements on the reporting system would be in order. In addition to the effect on reporting requirements, Nobes and Parker³ also suggest that tax harmonization would remove or minimize the tax barriers to the free flow of capital between countries and would also reduce the tax-motivated flow of goods and people between countries. One disadvantage of the harmonization process would be the potential loss of flexibility by involved countries to use their tax systems to satisfy revenue and social goals.

The purpose of this article is to report the results of a study which was designed to determine whether different tax systems increase the difficulty of the process of harmonizing financial reporting practices. Specifically, the study was designed to analyze the groupings of countries by two voluntary associations, the European Economic Community (EEC) and the Organization for Economic Co-operation and Development (OECD), to determine whether the corporate tax systems of the member countries of those organizations were at cross purposes with the harmonization of financial reporting practices among members of the organizations. The analysis consisted of aligning the countries based on two criteria: the tax base and the tax system. Certain variables dealing with the tax base and with the tax system were identified and the congruence of these variables among the member countries were compared.

INITIAL AND MODIFIED COUNTRY GROUPINGS

We chose to use the member countries of the EEC and OECD for this analysis. These countries are relatively homogeneous and therefore no significant variation between groupings based on membership and based on tax variables was expected. In addition, use of these two organizations creates a frame of reference for comparing the groupings which result from the tax variable analysis. Finally, the EEC has mandated through its Fourth Directive⁴ that member countries must significantly harmonize their accounting reporting practices. In addition, OECD has suggested that

³ Nobes and Parker, *Comparative International Accounting*, 365.

⁴ EEC Fourth Council Directive of 25 July 1978, based on Article 54(3)(G) of the Treaty on the Annual Accounts of Certain Types of Companies (Official Journal of the European Communities, No. L 222, 14 August 1978).

member countries should accord "... treatment under their laws, regulations, and administrative practices ..." to multinational operations based in another member country "... no less favorable than that accorded in like situations to domestic enterprises."⁵ Thus, these two organizations are actively encouraging harmonization among their member countries of financial accounting reporting systems and, in the case of OECD, tax systems. Exhibit 1 contains the membership of these two organizations at the time the study was conducted.

The data for this analysis were derived from a publication by Price Waterhouse and Company, an international public accounting firm. Published in 1982, with a cut-off date on new material of

Exhibit 1. Membership in the Organization for Economic Co-operation and Development (OECD) and the European Economic Community (EEC)

| <u>Group I</u> | <u>Group II</u> |
|---------------------|--------------------|
| <u>OECD MEMBERS</u> | <u>EEC MEMBERS</u> |
| Australia | Belgium |
| Austria | Denmark |
| Belgium | France |
| Canada | Germany, F.R. |
| Denmark | Greece |
| Finland | Ireland |
| France | Italy |
| Germany, F.R. | Luxembourg |
| Greece | The Netherlands |
| Iceland | The United Kingdom |
| Ireland | |
| Italy | |
| Japan | |
| Luxembourg | |
| The Netherlands | |
| New Zealand | |
| Norway | |
| Portugal | |
| Spain | |
| Sweden | |
| Switzerland | |
| Turkey | |
| The United Kingdom | |
| The United States | |

⁵ Organization for Economic Co-operation and Development, *Declaration by the Government of OECD Member Countries and Decisions of the OECD Council on Guidelines for Multinational Enterprises, National Treatment, International Investment Incentives and Disincentives, Consultation Procedures*, rev. ed. (Paris: OECD, 1979), 12.

June 30, 1981, the publication is an update of an earlier work by the same firm.⁶ It summarizes the corporate income tax systems in ninety countries. Unfortunately, it does not contain data on two OECD countries, Iceland and Turkey, and thus these countries were eliminated from the analysis.

The data were arranged alphabetically by country. Within each country, there was a discussion of the corporate income tax and any other taxes which might apply to corporations. There was some indication as to the taxation of branch income and a discussion of how income was determined. This latter category discussed such things as inventory valuation, capital gains, intercompany dividends, foreign source income, and other pertinent indicia of income as the tax base. There was some discussion of special deductions that were allowed within the country. The allowance of group taxation was indicated, and an analysis of the various tax incentives which were offered by the country was included. Finally, discussion concluded with a tabular presentation of the country's withholding tax rules.

The data for each country were admittedly summary in nature and did not include subtleties and nuances of the country's tax system. Thus, the present analysis is weakened by the inability to analyze the tax systems of each country in more detail than the data offered. However, in choosing the various factors which were included, Price Waterhouse seemed to use those which are most indicative of differences among tax systems for various countries. Therefore, even though the data are summary in nature, since they rely on certain common criteria which are present to some extent in all systems, they are, in our opinion, sufficiently reliable for analysis purposes.

The data were classified into two broad criteria, depending on whether the particular variables were more relevant to determination of tax base or indicative of the tax rate system. The tax base is the definition of the resource to which the tax is applied. The tax rate system is the manner in which the tax base is taxed.

From the data set, eight groupings of variables seemed most applicable to the tax base determination. These variables dealt with the source of income rules, the depreciation or capital recovery rules, inventory pricing to adjust for inflation, the taxation of capital gains, the provision for a deduction for operating losses, the treatment of dividends received from other corporations, the conformity of financial and tax accounting, and the deductibility

⁶ Price Waterhouse, *Corporate Taxes: A Worldwide Summary* (New York: PW, 1982).

of other taxes. With regard to the tax system, five variables were identified: the treatment of dividends paid to non-corporate shareholders, the nature of the rate system, the method used to provide tax incentives, the method used to ensure compliance with the tax laws, and the provision for group taxation.

Once the variables were identified, the classification process involved giving a relative weighting to subvariables within each variable. The subweightings were then summarized by country into Exhibits 2 through 6. A description of how the weighting process was performed and the subvariables used in the weighting process is contained in the Appendix.

DATA ANALYSIS

The use of multivariate statistical methods to group nations predates the work by Nair and Frank. As reported by R. J. Rummel,⁷ the Dimensionality of Nations (DON) Project, funded by the National Science Foundation, was a "large-scale attempt to map the cross-national domain." In the course of that project, a Q-type factor analysis was conducted to group nations according to their actual similarities, rather than geographical location or professed alignment.

A three-step method was used in the present study to model the feasibility of income tax harmonization.

1. A multiple discriminant function analysis was used to summarize the information in Exhibits 3, 4, 5, and 6 for insertion with Exhibit 2.
2. A Q-type factor analysis was then conducted on the data in Exhibit 2 to test the feasibility of income tax harmonization among member countries.
3. A second multiple discriminant analysis was used to define the differences between the country groupings disclosed by the Q-type factor analysis.

The First Discriminant Function Analysis

To obtain a single, simple measurement for depreciation methods, as presented in Exhibit 3, a multiple discriminant function analysis was performed using the United States versus all other countries as a priori groupings. The analysis was performed by the SPSS stepwise discriminant analysis. The summarized measures for de-

⁷ R. J. Rummel, *The Dimensionality of Nations* (Beverly Hills: Sage Publications, 1972), 12-15.

Exhibit 2. Tax Base and Tax System Criteria

| | Tax base variables | | | | | Tax rate system variables | | | | | | | |
|------------------------|--------------------|--------------------------------|---------------------------------------|-----------------------|---------------------------|-----------------------------|--------------------|------------------------------|-------------------------|------------|------------------------------|------------------------------|-------------------------|
| | Source 1. | Depre- ciation Exhibit 3 | Inventory (inflation) Exhibit 4 | Capital gain 2. | Operating losses 3. | Dividends received 4. | Book/ Tax 5. | Deduction for taxes 6. | Dividends paid 7. | Rate 8. | Incen- tives Exhibit 5 | Com- pliance Exhibit 6 | Group taxation 9. |
| 1. Australia | 1.0 | | | .1 | .6 | .4 | .6 | .1 | .7 | .5 | | | .4 |
| 2. Austria | 1.0 | | | .1 | .6 | .6 | .4 | .7 | .4* | .7 | | | .4 |
| 3. Belgium | 1.0 | | | 1.0 | .6 | .4 | .4 | .7 | .5* | .2 | | | .4 |
| 4. Canada | 1.0 | | | 1.0 | 1.0 | .6 | .6 | .7 | .5* | .5 | | | .4 |
| 5. Denmark | 1.0 | | | .1 | .6 | .6 | .6 | .3 | .5* | .5 | | | .6 |
| 6. Finland | 1.0 | | | .1 | .6 | .1 | .4 | .5 | 0 | .7 | | | .4 |
| 7. France | .35 | | | 1.0 | .6 | .6 | .4* | .1 | .5* | .5 | | | .6 |
| 8. Germany, F.R. | 1.0 | | | .1 | 1.0 | .1 | .4 | .7 | .5 | .5 | | | .6 |
| 9. Greece | 1.0 | | | .6 | .6 | .3 | .4 | .1 | 0 | .5 | | | .4 |
| 10. Ireland | 1.0 | | | .6 | 1.0 | .1 | .4 | .7 | .5* | .7 | | | .6 |
| 11. Italy | 1.0 | | | .1 | .6 | .3 | .4 | .7 | .4 | .5 | | | .4 |
| 12. Japan | 1.0 | | | .1 | 1.0 | .4 | .4 | .7 | 0 | .7 | | | .4 |
| 13. Luxembourg | 1.0 | | | .1 | .6 | .6 | .4 | .1 | .7* | .7 | | | .4 |
| 14. The Netherlands | 1.0 | | | .1 | 1.0 | .6 | .6 | .1 | .7* | .2 | | | .6 |
| 15. New Zealand | 1.0 | | | .1 | .6 | .1 | .6 | .1 | 0 | .5 | | | .3 |
| 16. Norway | 1.0 | | | .1 | 1.0 | .3 | .4 | .1 | 0 | .5 | | | .3 |
| 17. Portugal* | .8 | | | .6 | .6 | .6 | .4 | .1 | 0 | .7 | | | .4 |
| 18. Spain | 1.0 | | | .1 | .6 | .3 | .4 | .1 | 0 | .5 | | | .6 |
| 19. Sweden | 1.0 | | | 1.0 | .6 | .6 | .4 | .7 | .2 | .5 | | | .4 |
| 20. Switzerland | .35 | | | .6 | .6 | .6 | .4 | .1 | 0 | .7 | | | .3 |
| 21. The United Kingdom | 1.0 | | | .6 | 1.0 | .1 | .6 | .7 | .5* | .5 | | | .6 |
| 22. The United States | 1.0 | | | 1.0 | 1.0 | 1.0 | .6 | .7 | .7 | .7 | | | .6 |

* From Nobes and Parker.

+ Data based on industrial tax only.

Exhibit 3. Depreciation Methods

| Country | Equip- ment 10. | Build- ing 11. | Straight line 12. | Accel- erated 13. | Declining balance 14. | Tax payer choice 15. | Govern- ment stipulated rate 16. | Govern- ment stipulated lives 17. | Immediate write-off 18. | All depreciation recapture on sale ¹ 19. | Partial depreciation recapture on sale 20. | Additional first-year allowance 21. | Other Invest- ment incentives ² Deduction 22. | Credit 23. |
|------------------------|-----------------------|----------------------|-------------------------|-------------------------|-----------------------------|-------------------------------|--|---|-------------------------------|---|--|--|---|---------------|
| 1. Australia | X | — | X | X | X | X | X | X | — | X | — | — | X | — |
| 2. Austria | X | X | X | X | X | X | X | 0 | — | X | — | X | — | — |
| 3. Belgium | 0 | 0 | X | X | X | X | X | X | — | — | X | — | X | — |
| 4. Canada | X | X | — | — | X | — | X | — | — | X | — | X | X | — |
| 5. Denmark | X | X | X | — | X | 0 | 0 | 0 | — | — | — | X | — | — |
| 6. Finland | X | X | — | — | X | 0 | 0 | 0 | — | — | — | — | — | — |
| 7. France | X | X | X | X | X | 0 | X | 0 | — | X | — | X | — | — |
| 8. Germany, F.R. | X | X | X | X | X | X | — | — | — | X | — | — | — | — |
| 9. Greece | X | X | 0 | 0 | 0 | — | X | 0 | X | X | — | — | — | X |
| 10. Ireland | X | X | — | — | — | — | — | — | — | X | — | — | — | — |
| 11. Italy | X | X | X | — | — | — | X | — | — | X | — | X | — | — |
| 12. Japan | X | X | X | X | X | X | X | X | — | 0 | — | — | X | X |
| 13. Luxembourg | X | X | X | X | X | X | X | — | — | 0 | — | — | — | — |
| 14. The Netherlands | 0 | 0 | X | X | X | X | — | — | — | X | — | X | — | — |
| 15. New Zealand | X | X | X | — | X | 0 | 0 | 0 | — | X | — | — | — | — |
| 16. Norway | X | X | X | X | — | X | — | — | — | 0 | — | — | X | — |
| 17. Portugal | X | X | X | X | — | X | — | — | — | — | — | — | X | — |
| 18. Spain | X | X | X | X | X | — | — | — | — | — | — | — | — | — |
| 19. Sweden | X | X | X | — | — | — | X | X | X | X | — | — | — | — |
| 20. Switzerland | X | X | X | X | X | — | X | — | — | X | — | — | — | — |
| 21. The United Kingdom | X | — | — | X | X | X | X | — | X | X | — | — | — | — |
| 22. The United States | X | X | X | X | X | X | X | X | — | X | X | X | — | X |

X = Allowed

0 = Data inconclusive

— = Not allowed, not used

1 X, 0, or — entry must be considered in light of the system of taxing gains. If the gain is taxed at ordinary rates (i.e., No Capital Gains Tax), depreciation is in effect recaptured.

2 Does not include the effect of direct grants, loan guarantees, etc.

Exhibit. 4. Inventory Pricing Methods

| | Cost 24. | Market 25. | Replace- ment 26. | Lower of cost or market 27. | LIFO allowed No / Yes 28. | Weighted average 29. | Other with permission 30. | Net realizable value 31. | Inflation relief 32. |
|------------------------|-------------|---------------|-------------------------|--------------------------------------|------------------------------------|----------------------------|------------------------------------|-----------------------------------|----------------------------|
| 1. Australia | X | X | X | X | X | — | — | — | — |
| 2. Austria | — | — | — | — | X | X | — | — | — |
| 3. Belgium | — | — | — | X | X | — | — | — | — |
| 4. Canada | X | X | — | X | X | — | X | — | — |
| 5. Denmark | — | — | X | X | X | — | — | — | — |
| 6. Finland | X | — | X | — | X | — | — | — | — |
| 7. France | — | — | — | X | 0 | — | — | X | — |
| 8. Germany, F.R. | X | — | X | X | X | X | — | — | — |
| 9. Greece | — | — | X | X | X | — | X | X | — |
| 10. Ireland | — | — | — | X | X | — | — | — | — |
| 11. Italy | — | — | — | X | X | — | — | — | X |
| 12. Japan | X | — | — | — | X | — | X | — | — |
| 13. Luxembourg | X | — | — | X | X | X | X | — | — |
| 14. The Netherlands | — | — | — | X | X | — | X | — | — |
| 15. New Zealand | — | — | — | X | X | — | X | — | — |
| 16. Norway | — | — | — | X | X | — | — | — | — |
| 17. Portugal | X | — | — | X | X | — | — | — | X |
| 18. Spain | — | — | — | — | X | — | — | X | — |
| 19. Sweden | X | — | — | X | X | X | X | — | — |
| 20. Switzerland | — | — | X | X | X | — | — | — | — |
| 21. The United Kingdom | — | — | — | X | X | X | X | — | X |
| 22. The United States | — | — | — | X | X | — | X | — | X |

X = Allowed, required
 0 = Data inconclusive
 — = Not allowed

Exhibit 5. Tax Incentives Offered

| | Inward investment | | | Capital investment | | | Other | | | | | |
|------------------------|-------------------|------------------------|---------------|--------------------|-------------|------------------------|---------------|--------------|-------------|------------------------|----------------|--------------|
| | None 33. | Direct grant 34. | Credit 35. | Other 36. | None 37. | Direct grant 38. | Credit 39. | Other 40. | None 41. | Direct grant 42. | Credit 43. | Other 44. |
| 1. Australia | X | — | — | — | — | — | — | X | — | X | — | — |
| 2. Austria | X | — | — | — | — | — | — | X | — | — | — | X |
| 3. Belgium | 0 | — | — | — | — | — | — | X | — | — | — | X |
| 4. Canada | — | X | — | — | — | — | X | — | 0 | — | — | — |
| 5. Denmark | — | — | — | X | — | — | — | — | — | — | — | X |
| 6. Finland | 0 | — | — | — | — | — | — | X | — | — | — | — |
| 7. France | — | X | — | X | — | — | — | X | — | — | — | — |
| 8. Germany, F.R. | — | X | — | X | — | — | — | X | — | — | — | X |
| 9. Greece | — | — | — | X | — | — | — | — | — | X | — | X |
| 10. Ireland | — | — | — | X | — | X | — | — | — | X | — | X |
| 11. Italy | — | X | — | X | — | — | — | X | — | — | — | X |
| 12. Japan | X | — | — | — | — | — | X | — | — | — | X | X |
| 13. Luxembourg | — | — | — | X | — | — | — | — | — | X | — | X |
| 14. The Netherlands | — | — | — | X | — | — | — | X | — | — | — | X |
| 15. New Zealand | X ¹ | — | — | — | — | — | — | X | — | X | X ² | — |
| 16. Norway | — | — | — | X | — | — | — | X | — | — | — | X |
| 17. Portugal | — | — | — | X | — | — | — | X | — | X | X ² | X |
| 18. Spain | X ¹ | — | — | — | — | — | — | — | — | — | — | X |
| 19. Sweden | — | X | X | X | — | X | X | X | — | — | — | X |
| 20. Switzerland | — | — | — | X | — | — | — | X | — | — | — | X |
| 21. The United Kingdom | — | X | — | X | — | — | — | — | — | — | — | X |
| 22. The United States | X | — | — | — | — | — | X | — | — | — | — | — |

X = Positive characteristic

0 = Data inconclusive

— = Negative characteristic

¹ While there are no specific inward investment incentives, neither are there any limitations on country's origin and/or use of other incentives.² System of rebates of various taxes for certain investment activities.

Exhibit 6. Withholding Rules

| | Dividends | | | Interest | | | Royalties | | | | | |
|------------------------|---------------------|----------------|-------------------------|----------|---------------------|-------|-------------------------|-------|---------------------|-------|-------------------------|-------|
| | Resident individual | Corp. | Non-resident individual | Corp. | Resident individual | Corp. | Non-resident individual | Corp. | Resident individual | Corp. | Non-resident individual | Corp. |
| | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. |
| 1. Australia | | | X | X | | — | X | X | — | — | X | X |
| 2. Austria | X | X ¹ | X | X | — | — | — | — | — | — | X | X |
| 3. Belgium | X | X | X | X | X | — | X | X | — | X | X | X |
| 4. Canada | — | — | X | X | — | — | — | — | — | — | X | X |
| 5. Denmark | X | X | X | X | — | — | — | — | — | — | — | — |
| 6. Finland | X | — | X | X | X | — | X | X | X | — | X | X |
| 7. France | 0 | 0 | X | X | 0 | 0 | X | X | 0 | 0 | X | X |
| 8. Germany, F.R. | — | X | — | X | X | 0 | — | 0 | — | — | — | X |
| 9. Greece | X | X | X | — | X | X | X | X | — | — | — | X |
| 10. Ireland | — | — | — | — | 0 | 0 | X | X | 0 | 0 | X | X |
| 11. Italy | X | X | X | X | X | X | X | X | X | — | X | X |
| 12. Japan | X | X | X | X | X | X | X | X | — | X | X | X |
| 13. Luxembourg | X | X | X | X | — | — | — | — | X | X | X | X |
| 14. The Netherlands | X | X ¹ | X | X | — | — | — | — | — | — | — | — |
| 15. New Zealand | — | — | X | X | — | — | X | X | — | — | X | — |
| 16. Norway | — | — | X | X | — | — | — | — | — | — | — | — |
| 17. Portugal | 0 | 0 | X | X | 0 | 0 | X | X | 0 | 0 | X | X |
| 18. Spain | X | X | X | X | X | X | X | X | X | X | X | X |
| 19. Sweden | — | — | X | X | — | — | — | — | — | — | — | — |
| 20. Switzerland | — | — | X | X | X | X | X | X | — | — | X | X |
| 21. The United Kingdom | — | — | — | X | X | X | X | X | X | X | X | — |
| 22. The United States | — | — | X | X | — | — | X | X | — | — | X | X |

X = Requires withholding

0 = Data inconclusive

— = No withholding

¹ Dependent on stock ownership percentage.

preciation methods, resulting from this analysis, are presented in Exhibit 7.

Using this same methodology, Exhibits 4, 5, and 6 were summarized and inserted into the Revised Tax Base and Tax System Criteria in Exhibit 8. It should be noted that the discriminant function analyses are being used to provide summaries and should not be viewed as inferential tests.

The Factor Analysis

Q-type factor analysis is a seldom-used method that groups respondents rather than questions.⁸ After transposition of the data matrix, it is computationally identical to the more common R-type factor analysis. The interpretation of the Q-type factor scores, however, is quite different. Q-type factor indicates similarity to a group when scores are positive and dissimilarity when they are negative. Thus, in a two-factor model, there are four distinct classifications:

1. Similar to both models — both loadings are positive.
2. Similar to model 1 and dissimilar to model 2 — loading positively in factor 1 and negatively in factor 2.

Exhibit 7. Discriminant Scores Used to Summarize Depreciation Methods

| | |
|--------------------|---------|
| Australia | - .7591 |
| Austria | 1.7080 |
| Belgium | .7591 |
| Canada | .5693 |
| Denmark | - .9489 |
| Finland | .3795 |
| France | 1.7080 |
| Germany, F.R. | .5693 |
| Greece | 1.3284 |
| Ireland | .5693 |
| Italy | - .2087 |
| Japan | 3.0364 |
| Luxembourg | .3795 |
| The Netherlands | - .5693 |
| New Zealand | .9489 |
| Norway | .3795 |
| Portugal | - .7591 |
| Spain | - .7591 |
| Sweden | .5693 |
| Switzerland | .5693 |
| The United Kingdom | - .7591 |
| The United States | 3.2262 |

⁸ Joseph F. Hair et al., *Multivariate Data Analysis* (PPC Books, 1979), 218.

Exhibit 8. Revised Tax Base and Tax System Criteria

| Tax rate system variables | | | | | | | | | | | | |
|---------------------------|--------------------------------|--------------------------|-----------------|---------------------|-----------------------|--------------|------------------------|-------------------|------|------------------------------|------------------------------|-------------------|
| Tax base variables | | | | | | | | | | | | |
| Source | Depre- ciation Exhibit 3 | Inventory (inflation) | Capital gain | Operating losses | Dividends received | Book/ Tax | Deduction for taxes | Dividends paid | Rate | Incen- tives Exhibit 5 | Com- pliance Exhibit 6 | Group taxation |
| 1. Australia | 1.0 | -.7591 | .1 | .6 | .4 | .6 | .1 | .7 | .5 | -.6999 | -1.7496 | .4 |
| 2. Austria | 1.0 | 1.708 | .1 | .6 | .6 | .4 | .7 | .4* | .7 | -.6999 | .6999 | .4 |
| 3. Belgium | 1.0 | .7591 | 1.0 | .6 | .4 | .4 | .7 | .5* | .2 | -.6999 | .6999 | .4 |
| 4. Canada | 1.0 | .5693 | 3.2262 | 1.0 | 1.0 | .6 | .7 | .5* | .5 | 1.7496 | -1.7496 | .4 |
| 5. Denmark | 1.0 | -.9489 | -.7491 | .1 | .6 | .6 | .3 | .5* | .5 | -.6999 | .6999 | .6 |
| 6. Finland | 1.0 | .3795 | -3.415 | .1 | .6 | .4 | .5 | 0 | .7 | -.6999 | .6999 | .4 |
| 7. France | .35 | 1.708 | -3.415 | 1.0 | .6 | .4* | .1 | .5* | .5 | -.6999 | -.3499 | .6 |
| 8. Germany, F.R. | 1.0 | .5693 | 3.2262 | 1.1 | 1.0 | .4 | .7 | .5 | .5 | -.6999 | -.3499 | .6 |
| 9. Greece | 1.0 | 1.3284 | -.7591 | .6 | .3 | .4 | .1 | 0 | .5 | -.6999 | .6999 | .4 |
| 10. Ireland | 1.0 | .5693 | -.7591 | .6 | 1.0 | .4 | .7 | .5* | .7 | -.6999 | .3499 | .6 |
| 11. Italy | 1.0 | -.2087 | .5693 | .1 | .6 | .3 | .4 | .7 | .5 | -.6999 | .6999 | .4 |
| 12. Japan | 1.0 | 3.0364 | .5693 | 1.1 | 1.0 | .4 | .7 | 0 | .7 | -.6999 | .6999 | .4 |
| 13. Luxembourg | 1.0 | .3795 | 3.2262 | .1 | .6 | .4 | .1 | .7* | .7 | 1.7496 | .6999 | .4 |
| 14. The Netherlands | 1.0 | -.5693 | 3.2262 | 1.1 | 1.0 | .6 | .1 | .7* | .2 | 1.7496 | -1.7496 | .6 |
| 15. New Zealand | 1.0 | -.9489 | -.7591 | .1 | .6 | .6 | .1 | 0 | .5 | -.6999 | .6999 | .3 |
| 16. Norway | 1.0 | .3795 | -.7591 | 1.1 | 1.0 | .3 | .4 | 0 | .5 | -.6999 | .3499 | .3 |
| 17. Portugal* | .8 | -.7591 | .3415 | .6 | .6 | .4 | .1 | 0 | .7 | -.6999 | .6999 | .4 |
| 18. Spain | 1.0 | -.7591 | -.2087 | .1 | .6 | .3 | .4 | 0 | .5 | -.6999 | .6999 | .6 |
| 19. Sweden | 1.0 | .5693 | -.7591 | 1.0 | .6 | .4 | .7 | .2 | .5 | 1.7496 | .6999 | .4 |
| 20. Switzerland | .35 | .5693 | .5693 | .6 | .6 | .4 | .1 | 0 | .7 | -.6999 | .6999 | .3 |
| 21. The United Kingdom | 1.0 | -.7591 | -.7591 | .6 | 1.0 | .1 | .6 | .5* | .5 | -.6999 | .6999 | .6 |
| 22. The United States | 1.0 | 3.2263 | 3.2262 | 1.0 | 1.0 | .6 | .7 | .7 | .7 | 1.7496 | -1.7496 | .6 |

* From Nobes and Parker.

+ Data based on industrial tax only.

3. Dissimilar to model 1 and similar to model 2 — loading negatively on factor 1 and positively on factor 2.
4. Dissimilar to both models — loading negatively in both factors.

These groupings are shown on a Cartesian plane in Exhibit 9. Because the analysis includes two a priori groups (EEC and OECD), we would expect the countries to be similar to others in their own organization. Countries belonging to both groups should be in the first quadrant. Using the format in Exhibit 9, the relationship is presented in Exhibit 10. Notice that no countries are expected to lie in the third quadrant (type 4).

Again using the SPSS, the factor analysis was limited to two factors, and a VARIMAX rotation was performed. This resulted in the loadings presented in Exhibit 11. Notice that we can again group the countries on our Cartesian plane, as shown in Exhibit 12. Thus, the four groups are the following:

1. Similar to both models: Australia, Austria, Belgium, Denmark, Finland, France, Greece, New Zealand, Norway, Portugal, Sweden, and the United Kingdom.
2. Similar to OECD model only: Japan and Spain.

Exhibit 9. Q-Type Factor Analysis General Format of Relationships between Two Groups

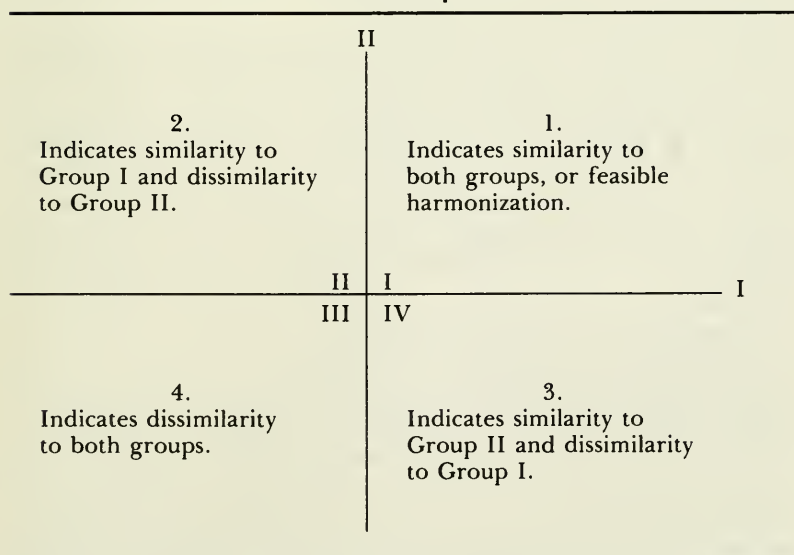
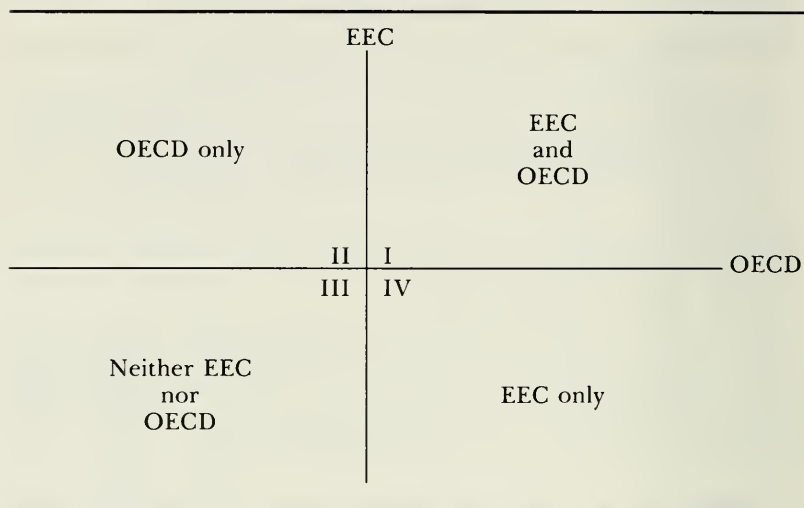


Exhibit 10. Q-Type Factor Analysis Format of Relationships between OECD and EEC

3. Similar to EEC model only: Germany, Italy, the Netherlands, and Switzerland.

4. Dissimilar to both models: Canada, Luxembourg, and the United States.

The Second Discriminant Function Analysis

Having disclosed, through the factor analysis, that four distinct country groupings exist among the OECD and EEC countries, we are immediately challenged to define those differences. This definition can best be achieved through a multiple discriminant function analysis using the complete variable sets from Exhibit 8 and the groupings in Exhibit 11. (Note that discriminant function analysis does not allow the use of variable sets which include missing values.) The method chosen for this study was the direct method.

A map of the territories of the four country groupings is presented in Exhibit 13. This territorial map is consistent with the map developed by the factor analysis (although the orientation is different since there is no rotation or orthogonality). Exhibit 14 plots the actual location of the member countries as defined by canonical discriminant functions one and two. Notice the tight clusters formed by the countries when the discriminant functions are applied. These maps were developed using the following variables:

| <u>Item number</u> | <u>Variable name</u> |
|---------------------------------------|---|
| Base and system criteria — Exhibit 2 | |
| 1 | Source |
| 2 | Capital gain |
| 3 | Operating losses |
| 4 | Dividends received |
| 5 | Book/Tax |
| 6 | Deduction for taxes |
| 7 | Dividends paid |
| 8 | Rate |
| 9 | Group taxation |
| Depreciation methods — Exhibit 3 | |
| 18 | Immediate write-off |
| 20 | Partial depreciation recapture on sale |
| 21 | Additional first-year allowance |
| 22 | Other investment incentives — deduction |
| 23 | Other investment incentives — credit |
| Inventory pricing methods — Exhibit 4 | |
| 24 | Cost |
| 25 | Market |
| 26 | Replacement |
| 27 | Lower of cost or market |
| 29 | Weighted average |
| 30 | Other with permission |
| 31 | Net realizable value |
| 32 | Inflation relief |
| Tax incentives offered — Exhibit 5 | |
| 34 | Inward investment — Direct grant |
| 35 | Inward investment — Credit |
| 36 | Inward investment — Other |
| 37 | Capital investment — None |
| 38 | Capital investment — Direct grant |
| 39 | Capital investment — Credit |
| 40 | Capital investment — Other |
| 42 | Other — Direct grant |
| 43 | Other — Credit |
| 44 | Other — Other |
| Withholding rules — Exhibit 6 | |
| 47 | Dividends, nonresident — Individual |
| 48 | Dividends, nonresident — Corporation |
| 51 | Interest, nonresident — Individual |
| 55 | Royalties, nonresident — Individual |
| 56 | Royalties, nonresident — Corporation |

Variables from Exhibits 2 through 6 were omitted if there were any inconclusive data as to the variable.

When using the direct method, a tolerance test (as the method defines) is conducted to check the discriminating ability of each variable. All variables passing the tolerance test are entered into

Exhibit 11. Varimax Rotated Factor Matrix

| Countries | Factor 1* | Factor 2* |
|-----------|-----------|-----------|
| Var 1 | .24396 | .54332 |
| Var 2 | .88567 | .21165 |
| Var 3 | .69828 | .52336 |
| Var 4 | -.69493 | -.22023 |
| Var 5 | .39221 | .80217 |
| Var 6 | .93814 | .30435 |
| Var 7 | .93637 | .08674 |
| Var 8 | -.81376 | -.37875 |
| Var 9 | .70942 | .37556 |
| Var 10 | .60450 | .57374 |
| Var 11 | -.14755 | .92108 |
| Var 12 | .23955 | -.63973 |
| Var 13 | -.89122 | -.25881 |
| Var 14 | -.84924 | .47821 |
| Var 15 | .21682 | .56202 |
| Var 16 | .62251 | .65881 |
| Var 17 | .84794 | .38975 |
| Var 18 | .66743 | -.08064 |
| Var 19 | .71057 | .60441 |
| Var 20 | -.03673 | .65668 |
| Var 21 | .44382 | .80921 |
| Var 22 | -.43424 | -.43049 |

| Transformation Matrix | | |
|-----------------------|----------|----------|
| | Factor 1 | Factor 2 |
| Factor 1 | .85409 | .52013 |
| Factor 2 | -.52013 | .85409 |

* Factor 1 — Grouping based on OECD.

Factor 2 — Grouping based on EEC.

the analysis. Variables from the mapping which are not included in Exhibit 15 were omitted because they failed the tolerance test either because they in fact did not discriminate or because there was no relationship to the discrimination. The resulting discriminant functions are presented in Exhibit 15.

IMPLICATIONS

Perhaps the most enlightening feature of this analysis lies not in the discriminant functions themselves but in the variables revealed as discriminators. Each variable marks an area where significant differences exist between groupings. They include all of the main variables from Exhibit 2: source, capital gain, operating losses, dividends received, book/tax, deduction for taxes, dividends paid, rate, and group taxation; five depreciation methods from Exhibit

Exhibit 13. Discriminant Analysis Territorial Map Representation of Exhibit 12 with No Rotation and No Orthogonality

| | | Canonical discriminant function 1 | | | | | | | | | |
|--|----------|-----------------------------------|-------|-----|-----|----------|-------|----|----|--------|---------|
| | | -80 | -60 | -40 | -20 | 0 | 20 | 40 | 60 | 80 | |
| | | + | + | + | + | + | + | + | + | + | + |
| C a n o n i c a l | 80 + 3 | | | | | 32 | | | | | 2221+ |
| | . 33 | | | | | 32 | | | | | 22111 . |
| | . 433 | | | | | 32 | | | | | 22211 . |
| | . 4433 | | | | | 32 | | | | | 22111 . |
| | . 4433 | | | | | 32 | | | | | 22211 . |
| | . 4433 | | | | | 32 | | | | | 22111 . |
| | . 4433 | | | | | 32 | | | | | 22111 . |
| | 60 + | 4433 | + | + | + | 32 | + | + | + | 22211 | + |
| | . 4433 | | | | | 32 | | | | 222111 | + |
| | . 4433 | | | | | 332 | | | | 22111 | . |
| D i s c r i m i n a n t | . 4433 | | | | | 322 | | | | 22211 | . |
| | . 4433 | | | | | 32 | | | | 22111 | . |
| | . 44333 | | | | | 32 | | | | 22211 | . |
| | 40 + | 44433 | + | + | + | 32 | + | + | | 22111 | + |
| | . 4433 | | | | | 32 | | | | 22211 | . |
| | . 4433 | | | | | 32 | | | | 22111 | . |
| | . 4433 | | | | | 32 | | | | 22211 | . |
| | . 4433 | | | | | 32 | | | | 22111 | . |
| | 20 + | + | 4433 | + | + | 32 | + | | + | | + |
| | . 4433 | | | | | 32 | | | | 22111 | . |
| F u n c t i o n 2 | . 4433 | | | | | 32 | | | | 22211 | . |
| | . 4433 | | | | | *332* | | | | 22111 | . |
| | . 4433 | | | | | 322 | | | | 22211 | . |
| | . 44333 | | | | | 32 | | | | 22111 | . |
| | 0 + | + | 44433 | + | + | 32 | 22211 | + | + | | + |
| | . 4433 | | | | | 32 | 2211* | | | + | . |
| | . 4433 | | | | | 322211 | | | | | . |
| | . 4433 | | | | | 32111 | | | | | . |
| | . * | | | | | 4433 | 3311 | | | | . |
| | . 4433 | | | | | 3311 | | | | | . |
| | -20 + | + | + | + | + | 44333311 | + | + | + | | + |
| | . 443311 | | | | | 443311 | | | | + | . |
| | . 4411 | | | | | 441 | | | | | . |
| | . 441 | | | | | 41 | | | | | . |
| | . 411 | | | | | 411 | | | | | . |
| | -40 + | + | + | + | + | 441 | + | + | + | | + |
| | . 41 | | | | | 41 | | | | + | . |
| | . 411 | | | | | 41 | | | | | . |
| | . 441 | | | | | 411 | | | | | . |
| | . 411 | | | | | 441 | | | | | . |
| | -60 + | + | + | + | + | 411 | + | + | + | | + |
| | . 441 | | | | | 441 | | | | | . |
| | . 41 | | | | | 41 | | | | | . |
| | . 411 | | | | | 411 | | | | | . |
| | . 441 | | | | | 41 | | | | | . |
| | . 41 | | | | | 411 | | | | | . |
| | -80 + | + | + | + | + | 411 | | | | | + |
| | . 411 | | | | | 411 | | | | | . |
| | . 411 | | | | | 411 | | | | | . |
| | . 411 | | | | | 411 | | | | | . |
| | | -80 | -60 | -40 | -20 | 0 | 20 | 40 | 60 | 80 | |

* Indicates a Group Centroid.

data (lack of depth and differentiation) than of a justification for concluding that the variables have no discriminating value.

Even more crucial to the attainment of harmonization is the variable of conformity between financial and tax accounting. Of the twenty-two countries analyzed, fifteen required complete conformity while the other seven had some degree of conformity. Intuitively, this suggests much difficulty in achieving the harmo-

Exhibit 15. Rotated Standardized Discriminant Function Coefficients to Define Group Borders in Exhibit 4

| Variable* | Function 1 | Function 2 |
|-----------|------------|------------|
| Item 1 | 13.63537 | 2.07762 |
| Item 2 | 22.32349 | 4.33622 |
| Item 3 | -.93208 | 3.89181 |
| Item 4 | -5.70654 | 4.26403 |
| Item 5 | 1.73174 | 3.89306 |
| Item 6 | -5.72923 | -.06802 |
| Item 7 | 11.91149 | 2.83237 |
| Item 8 | 10.80394 | -1.91531 |
| Item 9 | -7.95893 | -4.54921 |
| Item 18 | -9.89949 | -8.10019 |
| Item 20 | -11.07834 | -2.73200 |
| Item 21 | -1.52184 | -5.98893 |
| Item 22 | 2.85750 | -9.50820 |
| Item 23 | -7.84648 | -2.11007 |
| Item 24 | -9.21642 | 2.35973 |
| Item 25 | -7.80918 | -2.50294 |
| Item 26 | 6.79982 | -.67659 |
| Item 38 | -3.53479 | 5.63559 |

* From Exhibits 2-6.

APPENDIX

As mentioned previously, the classification process involved the assignment of numeric weightings to each significant subvariable within a given variable. In some instances, because of multiplicity of subvariables, a non-numeric system was used, one which involved a determination of the existence of the particular subvariable. The following describes the method by which the data contained in Exhibits 2 through 6 were derived from the data set.

With regard to the source of income column of Exhibit 2, five subvariables were identified. The source of income rules deal with the domestic taxation of income from both domestic and transnational sources. The five subvariables identified and their relative weights are the following:

| | |
|--|-----|
| All worldwide, without regard to company's country of origin | .8 |
| Doing business concept (within the country) | .35 |
| Passive source only (within the taxing country) | .35 |
| Both business and passive (within the country) | .7 |
| Credit for tax paid to another country | .2 |

If the datum was not available, a zero was entered. The decimals were chosen so a combination of several factors could not total more than 1.0. Thus, an entry of 1.0 means that the country taxes all worldwide income without regard to the company's country of origin but allows a tax credit for taxes paid to the other countries.

With regard to depreciation, Exhibit 3 contains the data that were

available for the various depreciation methods and capital recovery methods that were most common. Since there are a large number of possible methods of depreciation, decimal equivalents were not used but a classification was employed based on whether a particular method was allowed, which has been designated by X, whether the particular method was not allowed, designated by a dash, and whether the data were inconclusive, designated by a 0. Data were deemed to be inconclusive if, after reading the various information provided, it was not clear whether a particular method was or was not allowed. Conversely, if a particular method was mentioned specifically, the absence of mention of other alternative methods was deemed to be a situation of non-allowance.

With regard to inventory pricing methods, the same multiplicity of alternatives existed, thus necessitating the use of the allowed, not allowed, data inconclusive method of classification in Exhibit 4. Interestingly, several countries allow inflation relief. This concept allows the recognition of holding gains during periods of rising prices for having held trading stocks.

Returning to Exhibit 2, the next element of the tax base variable is the treatment of capital gains. The numeric factor relating to taxation of such gains at a lower rate than other income is .6. If the country made a distinction between short- and long-term gains, the factor would be .4, regardless of the time period needed to qualify as "long-term" (in some countries it would be two years, in the United States more than one year — more than six months after the Tax Reform Act of 1984.*) If the country did not allow any preferential treatment for the sale of capital assets, it was given a .1 factor, and if the data were not available or inconclusive, 0 was entered.

The next variable deals with the deduction which is available for operating losses. If the country had a provision for carrying back such losses, a factor of .4 was used. If the country had a provision for carry forward of such losses, a factor of .6 was used. If the country did not allow any tax benefit at all from such losses, a factor of .1 was used. Again, if the datum was not available or inconclusive, a 0 factor was used.

With regard to dividends received by corporations from other corporations, if the receipt of such dividends was wholly taxable, a factor of .3 was used. A factor of .5 was used if dividends were partially taxable dependent on the recipient's ownership percentage of the paying corporation's stock. A factor of .4 was used if the dividends were partially taxable without regard to the ownership of the underlying stock. If the dividends were not taxable because of an ownership percentage, a factor of .6 was used. If the dividends were not taxable without regard to ownership, a factor of .1 was used. If the datum was not available or inconclusive, a 0 was used.

The variable with regard to the conformity of book and tax income

* For tax years beginning after December 31, 1986, the Tax Reform Act of 1986 has eliminated preferential treatment for long-term capital gains. Such gains will now be taxed as ordinary income with a maximum rate of 34 percent for corporations and 28 percent for individuals. At the time of this research, the United States offered a preferential treatment for long-term capital gains.

was classified based on whether the country made any distinction at all between book and tax information or whether it required complete conformity of such items. Thus, the factor of .4 was used if no difference between book and tax expenses was allowed. A factor of .6 was used if there were situations where a difference between book and tax expenses was allowed. If the datum was not available or inconclusive, a 0 was used.

The last variable analyzed for the purposes of the tax base was whether the country allowed a deduction for other taxes imposed on corporations. If some of such other taxes were deductible, a factor of .7 was used. If none of such other taxes was deductible, a factor of .5 was used. If no other taxes were imposed, a factor of .3 was used. If other taxes were imposed, but it was not clear whether a deduction was allowed, a factor of .1 was used. Again, if the datum was not available or inconclusive, a 0 factor was used.

As mentioned previously, there were five variables analyzed with regard to the tax rate system. The first was the treatment of dividends paid to the noncorporate shareholders. This variable deals with whether corporate and individual tax systems are integrated. The factors used for the dividends paid variable were generated from both the Price Waterhouse data and from information contained in Nobes and Parker. If the country used the so-called classical system, in which dividends are not deducted by the corporation and are fully taxable to the noncorporate shareholder, a factor of .7 was used. If it employed the imputation system, in which some of the corporate tax is imputed to the recipient of the dividend, a factor of .5 was used. If it used a split-rate system, in which a lower tax on the distributed income was employed, a factor of .9 was used. If the country allowed the recipient an exclusion from income from dividends received, a factor of .3 was used. If it allowed a deduction for dividends paid by the corporation, a factor of .1 was used. If the datum was not available or was inconclusive, 0 was used.

With regard to the rate system variable, if the system was predominantly a progressive one, a factor of .7 was used. If the tax rate system was flat, a factor of .5 was used. If the tax rate system was regressive, a factor of .3 was used. If some other method of tax rates was used, a factor of .1 was used. If the datum was unavailable or not conclusive, 0 was used.

Exhibit 5 treats the provision for tax incentives offered by the tax rate system. Primarily, the determination here was whether the system itself offers some tax incentive such as tax credits or other types of incentives. Since there was a multiplicity of options available, numeric factors were not used. Instead, the designation used previously with regard to whether such an incentive was or was not offered or whether the data were inconclusive was used.

Exhibit 6 analyzes the country's attitude toward enforcement by means of withholding rules for certain types of passive income. It presents in non-numeric format information as to whether the country requires withholding for dividends, interest, or royalty and whether a distinction is made between residents and non-residents, and corporations and individuals. The designation used is whether withholding is required or not required, or whether the data were inconclusive.

The last factor in Exhibit 2 dealing with the tax rate system is whether

the country has some provision for group taxation. If the country allowed certain groups to file consolidated tax returns, a factor of .6 was used. If there was no provision for a consolidated tax return, a factor of .4 was used. If there were some other means used to mitigate the double taxation of such groups, a factor of .3 was used. If the datum was unavailable or inconclusive, 0 was used.

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The Concept of Synchronized Profit and Loss Accounting in Response to Continuous Increases or Decreases in Prices

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This paper investigates the way continuous increases and decreases in prices are treated in profit and loss accounting, a subject which has been a matter of controversy in business management in Germany for more than sixty years. This lengthy debate, although characterized by many thoughtful ideas, has yet to produce satisfactory results, in the opinion of the author. That is the incentive for this paper.

The background of the investigation is founded in the practice that the "official" balance sheet, which is based on the double-entry system, must be prepared in nominal terms. This means that continuous changes in enterprise-relevant prices can be accounted for only outside the official balance sheet through supplementary accounting analyses and supporting schedules to the profit and loss statement.

In recent discussions of profit and loss accounting for continuous changes in prices, the nominal profit and loss figures are often considered of too little significance to provide information.¹ The approaches directed to solving this problem to date have one

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¹ K. Hax, *Die Substanzerhaltung der Betriebe* (Köln: Opladen, 1957); G. Seicht, *Die kapitaltheoretische Bilanz und die Entwicklung und Bilanz* (Dusseldorf: 1979); U. Jacobs and U. Schreiber, "Betriebliche Kapital und Substanzerhaltung in Zeiten steigender Preise" (1979); G. Sieben and T. Schildbach, "Substanz- und Kapitalerhaltung, in *Hdwb. des Rechnungswesens*, 2nd. ed. (Stuttgart: C. E. Poeschl-Verlag, 1981), 1511 ff.

common idea: changes in prices must not be accounted for in the same conceptual manner in which the annual balance sheet is prepared (i.e., the "surplus" of annual revenue over annual expenses expressed in purely monetary terms). Rather, a different concept of profit should be used for profit and loss accounting through supplementary accounting steps. The conventional concept of surplus revenue is to be modified by introducing the maintenance of the enterprise as a subsidiary condition. In other words, a capital goods-related component is to be incorporated into the concept of profit that was basically purely monetary originally. The term "profit" is accordingly interpreted as that surplus revenue that has been realized beyond the expenditure necessary to maintain the enterprise, the "maintenance-oriented concept of profit."²

The proposals to date, the theories of the maintenance of real assets ("leistungsäquivalente Substanzerhaltung"), of the maintenance of purchasing power, and of the maintenance of income value power, consequently represent only specific versions of a single concept of profit and loss accounting, the "concept of capital maintenance-oriented profit and loss accounting." The only distinction between these different versions lies in the various interpretations of the concept of the capital maintenance of an enterprise. This concept of maintenance-oriented profit and loss accounting is, from the author's viewpoint, problematic. This is indicated by the numerous objections presented in the relevant literature. No attempt has yet been made to develop a solution that is not geared to the concept of the maintenance of the enterprise. This is the topic of this paper.

The reader is asked to consider the concept of "synchronized profit and loss accounting." This concept is based on the conventional, purely monetary concept of annual profit (annual profit equals annual revenues minus annual expenses incurred to realize this revenue). This concept is congruent with an accounting hypothesis being introduced in the event of an economic environment or continuously changing prices. According to this concept, profit and loss accounting is based not on the historical purchase price but on "synchronized" factor prices (i.e., prices considered representative of the respective accounting period).

² Supporters of this concept are K. Hax, *Die Substanzerhaltung der Betriebe* (Köln: Opladen, 1957); G. Seicht, *Die kapitaltheoretische Bilanz und die Entwicklung der Bilanztheorien* (Berlin, 1970); T. Schildbach, *Geldentwertung und Bilanz* (Düsseldorf, 1979); U. Jacobs and U. Schrieber, *Betriebliche Kapital — und Substanzerhaltung, in Zeiten steigender Preise*; G. Sieben and T. Schildbach, *Substanz — und Kapitalerhaltung in*. *Hdwb. des Rechnungswesens*, 2nd ed. (Stuttgart, 1981), Sp. 1511 ff.

THE QUESTIONABILITY OF THE CONCEPT OF MAINTENANCE-ORIENTED PROFIT AND LOSS ACCOUNTING

The following criticism is leveled at the concept of maintenance-oriented profit and loss accounting as a whole. The aspect of the maintenance of the enterprise cannot be justified either as a minimum goal of the enterprise or as a subsidiary condition.³ It is incompatible with the basic character of the enterprise that continuously changing market conditions sometimes imply growth, sometimes reduction. Currently, sufficient practical evidence demonstrates the importance a healthy reduction may be for the enterprise. If an enterprise cannot be profitable in the long term, liquidation or sale as a going concern is recommended.

The concept that annual profit based on the maintenance of the enterprise (profit equals excess revenues beyond the expenses necessary to maintain the enterprise) embodies an independent future aspect extending beyond the accounting period.⁴ This concept, however, is incompatible with the fact that the basis of a profit and loss statement is oriented strictly to the turnover achieved in the past accounting period and the relevant application of factors. A profit and loss statement referring to the past must, by definition, be based on a concept of profit referring exclusively to the profit-relevant business transactions of the past accounting period. A profit and loss statement referring to the past must by definition be based on a concept of profit referring exclusively to the relevant profit-oriented business transactions of the past accounting period.

The maintenance-oriented concept of profit does not meet the basic requirement of universal applicability. The introduction of the condition to maintain the enterprise into the concept of profit implies that specific restrictive assumptions must be made regarding the nature of business transactions. For example, the concept of profit orientation for maintenance of real assets is based on the assumption that the replacement assets to be acquired in the future are identical in quality with the assets being used in the present accounting period. This, as a rule, is a highly unrealistic premise.

Elements of the category of payment of the enterprise and elements of the category of goods are combined in the concept of

³ Hax, *Die Substanzerhaltung*; v. Zwehl, "Die Substanzerhaltung als Minimalziel des Unternehmens in Zeiten steigender Preise" in *Unternehmensführung und Organisation*, ed. W. Kirsch (Wiesbaden: Verlag Gabler, 1973), 175 ff.

⁴ The prognoses formulated within the framework of the balance sheet (service life of assets subject to wear and tear, provision for contingencies) are linked, in contrast, to past transactions (purchase of the facility, accrual of liabilities).

annual profit oriented to the maintenance of real assets (annual profit equals surplus revenue beyond expenditure involved in maintaining the tangible assets of the enterprise). This is incorrect. To be meaningful, the concept of profit must be defined either as a monetary surplus or as a goods surplus. The transfer of money and the transfer of goods represent corresponding events in a market economy.

THE CONCEPT OF SYNCHRONIZED PROFIT AND LOSS ACCOUNTING

Fundamental Issues

An alternative proposal, the concept of synchronized profit and loss accounting, is now presented. According to this concept, the annual profit figure is not oriented toward the target of the maintenance of the enterprise. Rather, it is directed to the determination of an annual profit or loss amount, despite continuous changes in prices that realistically include the decision-relevant empirical facts that must be reflected in the accounting record. The preconditions on which this approach is based are outlined here.

The concept of annual profit, on which the balance sheet is to be based, must first be defined. According to the pragmatic function of the balance sheet, it must be prepared in such a way as to be applicable in practice with sufficient reliability in the reported amounts. This is the case when the balance sheet is based on those business transactions that actually occurred in the past accounting period. Among all feasible concepts of profit meeting this requirement, that conventional concept of purely monetary surplus revenue, on which the official balance sheet is based, is used here.

For the concept of synchronized profit and loss accounting, the premise of particular significance is the concept on which annual profit is based (i.e., the sales and cost prices contained in the expenditure and revenue accounts refer to the same constellation of general framework conditions). The following is a brief explanation of this premise.

Fundamental to this premise is the empirical phenomenon of the interdependence of the enterprise-specific sales prices and factor amounts recorded in the annual expenditure and annual revenue. This relationship of interdependence applies to all economic variables of an economic system. Consider, for example, the extent to which the 1973 and 1979 increases in the price of oil affected the prices of all other goods, whereas the falling demand for crude oil has been influenced by changes in prices of other

goods. In addition, the prices of goods are determined by the general framework conditions to which the adaption process of all economic subjects of one system refer. This includes those phenomena that are not influenced by the actions of economic subjects and, therefore, generate data for an economic system. One considers in this connection, for instance, political structures, the degree of willingness to grant preferences (receptiveness to advertising), the willingness to buy (represented by price/demand curves with a given advertising volume), the level of industrial know-how insofar as it is not influenced by the enterprise, the general level of education of the work force, the trend and age structure of the population, and the social structure.

It follows that a comparison of sales prices and purchase prices in the concept of annual profit is meaningful only when these prices are related or contained within the same constellation of general framework conditions. This constellation forms the basis by which the annual totals of sales prices and purchase prices may be compared.

The concept of monetary surplus revenue is thus based on the following premise. The factor prices paid for the products sold in the relevant accounting period, and the sales prices received for them, belong to the same constellation of general framework conditions. This premise may be considered throughout as verifiable. Consider, for example, an enterprise where durable capital goods are applied in the first year of their service life.

The concept of synchronized profit and loss accounting is logically derived from the idea previously discussed: the surplus revenue figure accurately reflects the empirical statement of facts employed as a measure (e.g., the degree of qualification of the management) only when the enterprise-relevant sales prices and purchase prices to be recorded in the respective accounting period are based on the same constellation of framework conditions.

To simplify profit and loss accounting, the general framework conditions may be assumed to change only from year to year and to be constant within any one year, thus forming a specific constellation. Two different cases of temporal allocation of the sales prices and factor prices actually paid are considered under this assumption when preparing a balance sheet; it is assumed that the general framework conditions are constant within the accounting year.

First, sales prices and factor prices are actually paid or received in the same accounting period. In this case, there is conformity

from the beginning between this premise and the actual framework conditions. In this case, it is advisable to base the profit and loss statement on those prices actually paid or received. The profit and loss statement leads here to a nominal surplus revenue figure.

Second, the sales prices and factor prices actually apply to different accounting periods. In this case, a further subdivision is made in accord with the price development of the enterprise-specific goods:

1. The enterprise-relevant prices are constant over time; this case is virtually non-existent in practice.
2. The enterprise-relevant prices undergo a continuous change over time; this instance is the normal case in practice.

The concept of synchronized profit and loss accounting refers to the case that is representative of practice: the sales prices and factor prices are paid or received in different accounting periods, the general framework conditions undergoing a continuous change in the course of time. A discrepancy exists between the assumption that the sales prices and factor prices are related to the same constellation of framework conditions and the actual circumstances. For this reason, the nominal surplus revenue figure would be misleading here.

To bridge this discrepancy, the concept of synchronized profit and loss accounting provides for the introduction of the following hypothesis: the prices of the enterprise-specific products and factors are constant over time, namely at the level of the prices valid in that accounting period. The profit and loss statement is thus no longer related to actual circumstances but rather to fictitious conditions which nonetheless satisfy the assumptions.

The "synchronized profit amount" is then determined on the basis of this accounting hypothesis. This amount always deviates from the nominal profit figure when the trend of enterprise-relevant prices changes; the amount is lower than the nominal profit figure when prices increase continuously and higher when prices fall continuously.

The synchronized profit figure is a more accurate reflection than the nominal profit figure of the respective empirical statement of facts to be recorded when enterprise-relevant prices continuously increase or decrease. This would be the result if the preceding hypothesis were not introduced. An example is where the degree of qualification of the management is to be determined within the framework of management control (accounting) with inflationary

increases in prices. The inflationary effect is eliminated in the synchronized profit amount, so that this amount can be attributed to the activities of the management. This would not be feasible, by contrast, with the nominal profit figure.

It should be emphasized that the hypothesis of enterprise-relevant prices remaining constant over time can be valid only within certain limits. This accounting hypothesis has some major disadvantages.

First, the speculative profit realized specifically from temporal price differentials for the same good (raw materials, commodities) is not recorded. Let us consider an enterprise that had purchased a large quantity of one commodity sufficient to meet its needs for several years in expectations of rapid price increases. In this case, that proportion of profit resulting from this speculative transaction cannot be included in the synchronized profit amount of a subsequent accounting period. The quantities of this commodity used are entered in the profit and loss statement of the subsequent accounting period at the existing purchase price of that accounting period. This distorts the surplus revenue figure. The very goal of speculative transactions is to exploit price differentials. The concept of synchronized profit and loss accounting, on the other hand, relates prices to a single set of conditions.⁵

Second, this hypothesis leads to inconsistencies. Only the prices are manipulated, whereas the real profit processes are not changed, although they would have to be adapted in principle to the trend in prices. Thus, no allowance is made (e.g., when introducing the hypothesis of constant prices) for management to pursue a completely different business policy (e.g., marketing policy, financial policy) in this case rather than with continuous inflationary price increases. Alternatively, the increased storage costs arising from speculative transactions are recorded in the profit and loss account, although constant prices are considered.

This inconsistency is accepted in synchronized profit and loss accounting because the profit and loss statement must be prepared on the basis of actual profit and loss transactions in the interests of intersubjective verifiability.⁶ These defects in synchronized profit

⁵ This defect always occurs when factor prices approaching current prices are experienced. The concept of maintenance-oriented profit and loss accounting is thus concerned.

⁶ These inconsistencies also appear in maintenance-oriented profit and loss accounting. The theory of the maintenance of real assets, for example, assumes a completely or partially stationary enterprise process, whereas the real profit and loss transactions of the accounting period are changing throughout the accounting period.

and loss accounting apply in the same way to maintenance-oriented profit and loss accounting. They suggest that the surplus revenue figure can fulfill its function as a measure of a decision-relevant empirical statement of data only to a limited extent. The surplus revenue figure, for example, can be used only to a lesser extent to determine the degree of qualification of the management. This distortion of the surplus revenue figure is the price that must be paid for the formulation of this accounting hypothesis.

In view of this, management must evaluate the improvement in the surplus revenue amount, which is to be determined to fulfill the measurement function in comparison with the distortion of this amount. Generated by the hypothesis assumption, precise theses on this cannot, however, be made. The following statements apply only to the broad trend.

1. If the scope of speculative transactions is insignificant and if no essential significance is to be attributed to the distorting effects of formulating the hypothesis, the management will prepare a synchronized profit and loss statement in spite of the noted defects.
2. If, on the other hand, the time-related, price-speculative transactions contribute significantly to the annual profit, synchronized profit and loss accounting should be evaluated in comparison with another method of taking continuous price increases or decreases into account in the profit and loss statement. One alternative is the goods-related profit and loss statement; this is meaningful, however, only for specific enterprises (e.g., brokers and special commercial enterprises).⁷ In this statement, the quantity of one good of special relevance to the enterprise (e.g., steel, energy, coffee, tea, and wheat) is used as a measure of profit. A comparison is made, for example, between that quantity of the particular good that could have been purchased by the expenditure for the speculative good and that quantity of the particular good that could have been purchased with the proceeds from the sale of the speculative good. The profit in terms of good is defined by the difference between the later purchasable quantity and the initially purchasable quantity of the particular good.

A concluding related comment is necessary concerning the relationships between synchronized profit and loss accounting and

⁷ Goods-related profit and loss accounting has nothing in common with the concept of maintenance-oriented profit and loss accounting as the matters of goods and money are intermingled in the latter. In goods-related profit and loss accounting, on the other hand, this is not the case because profit is defined as an increase in the quantity of goods.

the principle of realization — the question whether this concept is compatible with the principle of realization. The motive for this may be the fact that the synchronized annual profit amount is higher than the nominal profit amount when prices are undergoing a continuous decrease. For the accounting hypothesis, factor prices remaining constant at the level of the prices of the respective accounting period lead to depreciation allowance and use of goods being assessed at lower amounts than those corresponding to the historical purchase prices. This may lead, however, to the criticism that synchronized profit and loss accounting is not compatible with the principle of realization because the latter is identical with the principle of historical cost. Accordingly, the annual expenditure should not be less than would correspond to the historical purchase prices of the factors.

This objection is invalid. The principle of realization must not be identified with the principle of historical cost. Rather, it is to be interpreted as a purely time-related principle that is not necessarily associated with the principle of historical cost.

This strict separation of the principles of realization and historical cost is necessary because the principle of realization is geared solely to the date on which the profit is determined and thus refers merely to completion of the business transaction; profit is not determined until after a business transaction is completed (i.e., after delivery of the product sold). Determination of the profit figure is not relevant here.

In comparison, the principle of historical cost refers to determination of the profit figure. Historical costs must always be accorded in the profit and loss statement. The differentiation between the principle of realization and the principle of historical cost is recommended for this reason. Although these two principles can be combined (in which case we have the “nominal profit and loss statement”), they need not be. In times of continuously changing prices in particular, it is meaningful to combine the principle of realization with the “principle of valuation at synchronized purchase prices or production costs respectively.”

Implementation of Synchronized Profit and Loss Accounting

Implementation is characterized by synchronized individual prices (i.e., the purchase prices paid in the respective accounting period being recorded for the cost of goods used in that period). This is accomplished as follows: synchronized purchase and production costs are determined for stocks of raw materials, goods, semi-finished products, and finished products purchased or manufac-

tured in previous periods and on hand at the start of the accounting period. In the case of fixed tangible assets subject to wear and tear, annual depreciation allowances are calculated on the basis of the synchronized purchase prices.

Some problems resulting from the implementation of synchronized profit and loss accounting must be noted. First, as far as the entry of the synchronized prices (of cost factors purchased earlier) to be allocated to the respective accounting period is concerned, no problems exist if the factor in question is marketable and shows a constant price in the course of the accounting period. In this case, this market price is simply entered. If the enterprise obtains goods of the same type from different sources at different prices, the weighted average of the purchase costs per unit must be entered. Difficulties arise, however, when these premises are not actually fulfilled. This situation includes the problem of determining synchronized prices with continuous price changes in the course of the accounting period.

If the market price of a factor changes within the accounting period (constant rise, constant fall, fluctuation), a purchase price per unit of this factor (e.g., per ton of steel) representative of the period is entered. In this case, the question of how the representative factor price for the past accounting period is to be determined may arise. This question can be approached according to different situations:

1. If one type of factor is purchased continually in the course of the accounting period, the weighted average price is important as a proper price representative of that year. Then the price representative of the year can be reduced to purchase prices actually incurred.
2. The case is different when no purchase of one type of factor has been made in the accounting period or when purchases were made only at the very beginning or at the very end of the period. The question here is the determination of a market price for the good. In this case, the price existing at mid-year or the price to be paid in the month of maximum use could be used as the factor price best representative of the accounting period. The price representative of the accounting period would, however, deviate from the actual purchase price.

Another difficulty occurs when a production facility purchased in previous accounting periods and used in the respective accounting period can no longer be purchased as a new product due to

technological change. How is the depreciation of this facility to be reflected for the accounting period? A modern unit now on the market may be more efficient both quantitatively and qualitatively and may operate more economically. How is the synchronized purchase expenditure of the old facility to be determined? The improvised approach of referring to the current purchase price last ascertained for the old facility and updating it by means of the rate of price increase of the new type of facility is suggested.

The determination of the synchronized expenditure amount in the case of semi-finished and finished products manufactured in a previous period also presents problems. For precise accounting, the synchronized production costs per unit of each product or semi-finished product would have to be determined separately. This would, however, cause considerable difficulties in determining depreciation allowances.

For this reason, it may be advisable not to attempt the exact determination of the synchronized full costs of each product unit⁸ and to limit the determination to synchronized individual costs (direct wages, direct material, supplementary costs). The inclusion of an overhead cost amount in which the price increase is approximated should, however, also be considered.

CONCLUSION

The significance of synchronized profit and loss accounting is its provision of a practical mental concept for an enterprise already changing prices in the balance sheet. In practice, some enterprises already comply with the requirement that changing prices should be reflected in the balance sheet.⁹ In the Federal Republic of Germany, some firms perform this by recording current prices for the costs of goods used in the accounting period in a supplement statement to the official balance sheet. This procedure, which is in itself quite correct, is based, however, on the concept of a profit and loss statement oriented to the maintenance of real assets.¹⁰

In fact, the statement oriented to the maintenance of real assets is not prepared at all. The practitioner is directed by common

⁸ In the author's opinion, full costs per product unit must be entered to set the limits of the profits of the period correctly.

⁹ A well-known example is the Phillips Company, Netherlands.

¹⁰ See M. Bierich, "Substanzerhaltungsrechnungen in der Praxis," *BfuP* (1973), 521 ff.; P. Schumacher, "Scheingewinne durch Preissteigerungen bei abnutzbaren Sachanlagevermögen und Maßnahmen zur Verhinderung ihrer Ausschüttung," *BfuP* (1973), 563 ff.; G. Sieben, T. Schildbach, *Substanzerhaltung und anteilige Fremdfinanzierung. Ein Beitrag zur Behandlung des Schuldenproblems in den Jahresabschlüssen bei Geldentwertung*, 577 ff.

sense. For example, the narrow premise that the concept of accounting oriented to maintain real assets alone can be meaningfully applied is thus completely negated. An example is the premise of the totally or partially stationary enterprise environment.

One can conclude that efforts in practice to reflect continuous price changes in the balance sheet can be based far more plausibly on the concept of synchronized profit and loss accounting than on capital maintenance-oriented profit and loss accounting. The enterprises thus may be said to be preparing a synchronized, not a maintenance-oriented, profit and loss statement.

This paper has considered the problem of profit and loss accounting under conditions of continuous changes in prices. The widely held view that a concept of profit oriented toward the maintenance of the enterprise is assumed as a basis for the annual profit and loss statement. The author views that basis as problematic and alternatively develops another concept termed "synchronized profit and loss accounting." This concept is based on the traditional annual profit concept. The profit and loss statement is based not on historical purchase prices but on fictitious prices representative of the present accounting period, if prices increase and decrease continuously. These prices are considered "synchronized factor prices."

Tertiary Education Strategies for Accounting in Developing Societies — The Southwest Pacific as a Case Study

ROGER JUCHAU, MICK WHITE, and ROGER HOPKINS*

All societies face some degree of constraint in their development by the limited availability of economic resources. The economic development that a society achieves depends, in large part, upon the efficient utilization of its resources. The resource allocation exercise is crucial to all economies, particularly to low per capita income countries of the Third World, where a scarcity of economic resources persists and can be particularly acute.

In allocating scarce resources, Third World countries not surprisingly place a high priority on such activities as medical programs, public services, and new technology and industrial base development. It is hardly surprising to find that when countries allocate resources to such priorities, the countries have inadequate resources to develop many of the administrative systems necessary to implement the allocation decisions efficiently. Third World countries find themselves in a vicious circle. The greater the scarcity of resources, the greater the support required for information systems that will provide the information necessary for

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good allocation decisions. As presented in the case studies conducted by Enthoven,¹ Third World countries seriously lack adequate accounting information systems, particularly at the macro-economic decision level. These systems are the prime source of information upon which economic decisions are made. The building of sound infrastructures for accounting systems clearly has priority in the ranking of national investment alternatives in low per capita income economies.

INFLUENCES ON ACCOUNTING PRACTICE

Economic factors, although important, are not the only determinants of the development of an accounting information system in a country. Parker has identified a number of variables and relationships that can influence the development of accounting practices.² These variables and relationships identified are represented in Parker's contingency model in Exhibit 1.

Despite its low per capita gross national product, India, for example, has a strong accounting profession providing a full range of services due largely to cultural variables which have also been affected by "colonial" influences.

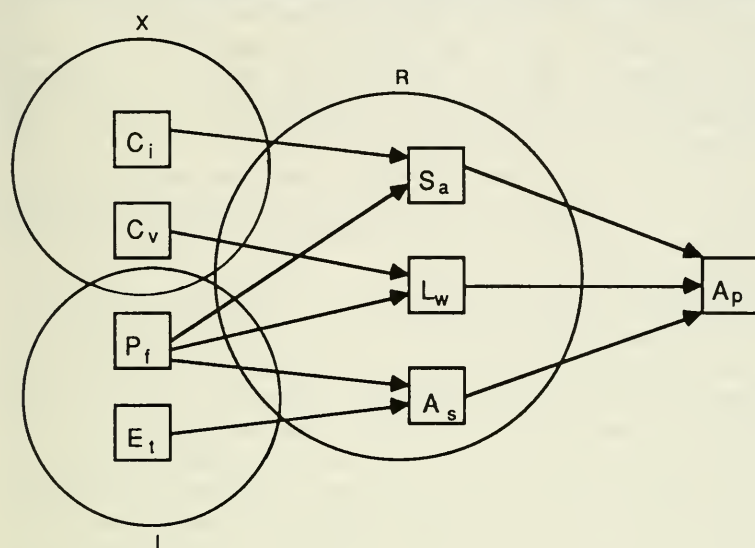
The overlapping circles in Parker's model reflect the possibility that the external professional, the internal professional, and the regulatory environments may all interact. Further relationships may, and probably do, exist beyond those specifically identified by Parker. For example, continuing education programs can serve to strengthen the accounting professions (Et influences Pf).

From the factors identified, action through the "internal professional environment" seems to offer the best opportunity to promote sound accounting practice in Third World countries. To this end, professional bodies have been encouraged to devise short-, medium- and long-term plans for their development by agencies such as the Asian Development Bank. There appears little opportunity to affect past colonial influences and extant cultural variables.

Colonial influences have been significant. Nations acquiring independence in the twentieth century have largely retained the accounting systems of their colonial power, a factor reinforced by current trade patterns largely determined by past colonial affilia-

¹ A. J. H. Enthoven, *Accounting Systems in Third World Economies* (New York: North Holland, 1977), 117-343.

² L. D. Parker, "A Contingency Model of Accounting Practices in Developing Countries," *Accounting Forum* (March 1984), 19-33.

Exhibit 1. A Contingency Model of Developing Country Accounting Practice

C_i = "colonial" influences

C_v = cultural variables

P_f = fledgling accounting profession

E_t = education and training

S_a = lack of local accounting standards

L_w = legislation

A_s = shortage of accountants

A_p = accounting practice

R = the regulatory environment

X = the external professional environment

I = the internal professional environment

tions. Although the accounting systems meet the needs of the First World countries that developed them, whether or not such systems can be adopted *carte blanche* by other societies without there being certain dysfunctional effects is open to question.³

Cultural variables no doubt have a mediating influence on the development of accounting systems. In some cases, this may be reflected by the indifference shown to formal reporting which may impede rather than promote accounting development, particularly in societies with a strong oral tradition.

Development of accounting systems may be stimulated by help

³ See R. Briston, "Accounting Evolution in Developing Countries," *International Journal of Accounting* (Fall 1978), 105-20.

from the accounting profession in the Third World directly or indirectly through education programs. In the Third World, these almost invariably depend on First World materials (e.g., texts, correspondence, and course materials) and expatriate staff. These programs may unwittingly help to perpetuate colonial influences that may be inappropriate to Third World value systems.

Although the importance of help to foster the fledgling professional accounting bodies has been recognized by their First World counterparts, provision of help has, to date, been modest. There are two possible reasons for this.

First, many Third World communities, although aware of their own economic and social aspirations, are unable to perceive how accounting systems can help frame the appropriate decision bases necessary to achieve their aims. The experience of accounting systems in these communities is one where reports are made to colonial-type authorities and supranational trading organizations which often have goals incongruent or, in some cases, at odds with those of the local society. Their experience is limited largely to the reporting function. Utilization of information provided by such output of the accounting system is, for internal decision making, a dimension virtually unknown to them. The seriousness of this problem is reflected not merely by the inability to use information effectively in areas of planning and decision making but even with regard to routine control of areas such as cash management. The problem is perpetuated by the fact that very few nationals of Third World societies hold internationally recognized accounting qualifications, and many of those who do are attracted to immigrate to the First World by pay and conditions beyond those their own countries can offer.

The second reason is that First World professional bodies have been reluctant to offer help, perhaps feeling that to provide such help would appear to be arrogant and would perhaps reinforce the old colonial influences that Third World countries seek to discard.

The opportunity to develop accounting practices appears to be largely limited to the initiatives that can be taken through the educational systems. To demonstrate the effect an educational system might have on such development, a Third World area in which accounting education has only recently been introduced is taken as a case study. The independent island communities of the Southwest Pacific offer an appropriate area to study since prior to 1972 there was no formal provision of post-secondary school

education in accounting in this region. To that time, the view was that full qualifications in accounting could be suitably obtained by individual students studying outside the region. The small number requiring such training warranted no special provision in the tertiary education provisions of the governments of the region. This view was challenged and refuted by a manpower study of 1973.⁴

ACCOUNTING EDUCATION PROVISIONS

Since 1972, four institutions of tertiary education in this region have introduced courses in accounting. These are Atenisi University (Tonga), the Fiji Institute of Technology (formerly Derrick Technical Institute), Honiara Technical College (the Solomon Islands), and the University of the South Pacific (the main campus is located in Fiji, but the university serves all the independent island communities of the region). Atenisi and Honiara Technical College offer courses at the accounting technical level, Atenisi offers its own qualification system, and Honiara prepares students for examinations conducted by external examination bodies in the United Kingdom. The Fiji Institute of Technology (FIT) operates its own courses and confers its own qualifications. The courses range from the certificate in accounting, a technical level program, to the diploma in business studies, a program designed initially to provide a broad-based practical education in functional management skills but which to date has been biased toward accounting and financial options. The University of the South Pacific (USP) has offered internationally recognized degree programs with an accounting option since 1975. USP also offers certificate and diploma in accounting studies qualifications. The certificate qualification is at the technical level, while the diploma is comparable in academic standard to the diploma in business studies offered at FIT. USP offers such courses in response to its role as the sole tertiary educational institution serving a region of nine island nations.

University of the South Pacific

Most of the island communities have no post-secondary school education facilities of their own and consequently look to USP to meet most of their tertiary education needs. As part of a review of the impact of accounting education in the Southwest Pacific, it

⁴ See R. Juchau, "Accounting and the Island Economies of the South Pacific," *Australian Accountant* (November 1973), 582-89.

is useful to focus primarily on the work undertaken at USP and the environment in which it operates.

The accounting degree program was developed before the certificate and diploma qualifications were established at USP in 1981. The accounting major, whose development is based on recommendations made to the Commonwealth Foundation in 1974, is a full degree program designed to provide an education that could lead to membership in the Fiji Institute of Accountants (FIA). The FIT's business studies diploma qualification allows for entry into the university degree program with standing: currently, five cross-credits are granted, providing an indirect path to full institute membership, and it permits diplomates to take affiliate membership in FIA.

The Western Samoan Society of Accountants (WSSA), the only other established body of accountants in the region, conducts its own courses and examinations for membership. These are less demanding than those for the university degree program. WSSA members can obtain limited cross-credits for the university degree program. Samoans with an accounting major from USP can secure membership in their society upon graduation. The embryonic Vanuatu Accountants Association has yet to identify its educational requirements for membership, although early indications suggest that they will be somewhat less demanding than those of FIA. Attempts to establish an Institute of Solomon Island Accountants have proved unsuccessful. Plans are currently in progress to establish an institute in Tonga, although the criteria for membership have yet to be determined.

Refinements in the course structure of both the university degree and the FIT diploma programs have been made largely with the evolving needs of FIA in mind. Although approximately 70 percent of all students entering USP are Fiji nationals, 87 percent of the accounting major graduates come from Fiji. The "others" category relates to students from countries outside the region served by USP. The one student graduating in 1978 was from Australia; the four students in this category graduating in 1981 were from Zimbabwe. Exhibit 2 categorizes USP accounting majors according to nationality.

Comments in reports made by past external assessors of the accounting discipline indicate that the standard of USP's accounting degree program is comparable to that of Australian universities. In general terms, such a favorable evaluation of academic standards is welcome both to the university and the communities it serves.

Exhibit 2. Graduates of USP with Accounting Majors by Country

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---------------|------|------|------|------|------|------|------|
| Cook Islands | 1 | | | | | | |
| Fiji | 4 | 9 | 13 | 13 | 22 | 20 | 35 |
| Kiribati | | | 1 | 1 | 1 | | |
| Tonga | | 1 | | 2 | | 1 | 2 |
| Western Samoa | | | | 1 | | | |
| Others | | 1 | | | 4 | | |

Source: USP Academic Office

These comments clearly reflect on the program content as well as its quality. Some writers have questioned whether accounting curricula in Third World universities should follow those of the First World. Sensitive curriculum design, which meets the special needs of the Third World communities, is held to be a more defensible strategy than slavishly adopting curriculum approaches and standards of advanced economies.⁵

The university's accounting staff have, with the exception of two associate lecturers, been recruited from developed economies outside the university's region. They devised the degree program and its constituent courses. In doing so, they drew on their prior curriculum experience in Australia, New Zealand, and the United Kingdom.

ACCOUNTING AND OTHER DEVELOPMENT ISSUES

The statistics presented in Exhibit 3 indicate that Fiji is by far the largest and most developed of the communities served by USP.

The level of accounting services and their regulation that gives optimum benefit to the community will be the level that equates marginal benefits of accounting information with marginal costs. This depends not merely on the extent of the economy's development but also on the community's size and standard of education. It is not surprising that Fiji is the only island state among the island nations that has corporate regulation, although the disclosure requirements and general provisions of this legislation have met with certain reservations, being regarded by some practitioners as unworkable.⁶

Local accounting standards have been issued by both FIA and WSSA, but these are no more than almost total adoptions of the

⁵ See Briston, "Accounting Evolution," 107-20.

⁶ See M. White, "Accounting Practice Problems in Fiji — Six Years On," *Fiji Accountant* (June 1984), 12-16.

Exhibit 3. Pacific Island States and Territories: Basic Indicators*

| State | Land area Km ² | Sea area† (000 Km ²) | Population (000) | Density (people/ Km ²) | 1980 total GNP (US\$M) | 1980 GNP per capita (US\$) | 1980 adult liter- acy % |
|-----------------|------------------------------|-------------------------------------|---------------------|--|---------------------------------|-------------------------------------|----------------------------------|
| Cook Islands | 240 | 1,830 | 17.9 | 75 | 20 | 1,360 | 91.8 |
| Fiji | 18,272 | 1,290 | 634.1 | 35 | 1,160 | 1,850 | 75.0 |
| Kiribati | 690 | 3,550 | 58.6 | 86 | 50 | 770 | 95.0 |
| Nauru | 21 | 320 | 7.3 | 348 | 70 | 9,091 | N/A |
| Niue | 259 | 390 | 3.4 | 13 | 3 | 1,080 | 100.0 |
| Solomon Islands | 28,530 | 1,340 | 225.2 | 8 | 110 | 460 | 51.0 |
| Tonga | 699 | 700 | 97.4 | 139 | 50 | 520 | 99.6 |
| Tuvalu | 26 | 900 | 7.5 | 288 | 4 | 570 | 98.0 |
| Vanuatu | 11,880 | 680 | 117.5 | 10 | 60 | 531 | N/A |
| Western Samoa | 2,935 | 120 | 156.4 | 53 | 119 | 770 | 97.8 |

* Source: Report of the Committee to Review, *The Australian Overseas Aid Program* (Canberra: Australian Government Publishing Service, 1984), 170.

† Sea areas are based on a 200-mile exclusive economic zone.

international accounting standards issued by the International Federation of Accountants or of those promulgated by the Australian professional bodies.

The factors in Parker's model provide a framework to evaluate whether degree level studies in accounting serve Fiji's interests better than those of other islands in the region. Although the island states in the region have been exposed to similar colonial influences, their societies have reacted differently toward these influences since gaining independence. Fiji regards the British Commonwealth's economic influence, at least in general terms, as benign. This has facilitated Fiji's retention of the administrative and commercial patterns established toward the end of the pre-independence period by what has been regarded as an enlightened colonial administration.⁷ This has been less true of the other countries in the region, particularly Vanuatu.

Although colonial influences on the island states have been similar, the cultural variables Fiji has experienced are strikingly different from those of the other countries. This is because Fiji is a multiracial society, its population composed of Melanesians (the indigenous Fijians, 46 percent), Indians (also 46 percent), and the balance of Chinese, Caucasians, and emigrants from other island states. The other islands are populated, apart from small communities of Chinese and Caucasian settlers, exclusively by Polynesians (Cook Islands, Niue, Tonga, Tuvalu, and Western Samoa), Melanesians (Solomon Islands and Vanuatu), and Micronesians (Kiribati). Such communities developed around a closed market economy sustained by local product exchange (intraisland). Limited trade occurred between settlements of the island races, but a high degree of economic independence existed in each settlement. Exposure to the outside world has been relatively recent as indicated by the dates these countries obtained colonial or protectorate status.⁸ Many of the more isolated islands within an archipelago

⁷ See J. Michener, *Return to Paradise* (New York: Secker & Warburg, 1956).

⁸ The independent island communities of the Southwest Pacific comprise the states of Fiji, Kiribati, Nauru, the Solomon Islands, Tonga, Vanuatu, Western Samoa, Tuvalu, and the New Zealand protectorates of the Cook Islands and Niue. Fiji, Kiribati (formerly Gilbert Islands), the Solomon Islands, Tonga, and Tuvalu (formerly Ellice Islands), were all administered by Britain prior to their independence. The Cook Islands and Niue were the responsibility of New Zealand, and Nauru was administered by Australia. Western Samoa was originally a German colony but became a trust territory of New Zealand in 1919. Only Vanuatu (formerly New Hebrides) has had colonial experiences of a type not associated with the British Empire since it was administered by an Anglo-French condominium. The dates on which these countries became colonies or protectorates were

still effectively operate a barter economy. In contrast, the Indian, Chinese, and Caucasian communities have adopted complex trading systems and have devised sophisticated and contemporary methods of finance. Particularly in the Indian culture, to be engaged in commercial activity affords one a high status in the community. Accounting systems are a vital requisite of such commerce. In the Indian society, for example, the accountant enjoys a very high status, more so than among other island community groups. The effect of this cultural factor is reflected in the ethnic classification of FIA membership, which has a predominance of Indian members (see Exhibit 4).

ACCOUNTING MANPOWER NEEDS OF THE ISLAND COMMUNITIES

The forces that influence Fiji are far more conducive to the development of sophisticated accounting practice than those existing in the other island states. USP is especially able because of its degree program to meet Fiji's manpower needs.

Analysis suggests that the manpower needs of the other countries of the Southwest Pacific lie largely with accountants trained to sub-degree levels. This has been indicated by past and current

Exhibit 4. Ethnic Classification of Membership of Fiji Institute of Accountants (1984)

| | <u>Indians</u> | <u>Fijians</u> | <u>Chinese and Caucasians</u> |
|--|----------------|----------------|-----------------------------------|
| Holders of certificate of public practice | | | |
| | 20 | — | 12* |
| (those in practice on their own behalf or in partnership) | | | |
| Fully qualified chartered accountants | 122 | 8 | 40 |
| Provisional† members | <u>31</u> | <u>5</u> | <u>2</u> |
| TOTAL | 173 | 13 | 54 |

* Of this number, three are partners of firms residing overseas.

† Provisional members are those who have completed the formal educational requirements of membership but have not completed the period of practical training necessary for full membership.

Source: Office of the Registrar, Fiji Institute of Accountants (July 1984).

Cook Islands (1901), Fiji (1876), Kiribati and Tuvalu collectively (1892), Nauru (1919), Niue (1901), Solomon Islands (these became British protectorates individually over the period 1893–1900), Tonga (1900), Vanuatu (Anglo-French condominium 1906), Western Samoa (German colony 1899) and New Zealand trust territory (1919).

empirical research.⁹ In general, in the economies outside Fiji, highly trained accountants are required only for strategic posts in the civil service. They are directly involved in the formulation of economic development policies and/or monitoring and controlling the government bureaucracy. Accountants in such posts are better prepared for their work by a double major degree in accounting/economics or accounting/administration than by a specialized program of study designed for entry to the accounting profession in Fiji.

Graduate accountants are employed by the multinational enterprises that operate in the island communities, although operations of such firms are limited. Burns Philp, for example, operates in the various islands as branches of its South Pacific subsidiary, which has its head office in Suva, Fiji. Such arrangements considerably reduce the demand for graduate accountants outside Fiji. The need for accountants in public practice outside Fiji is also limited given the small scale and non-complex forms of commercial activity.

Vanuatu, which is a tax haven, is an exception to the rule. To provide the services necessary to attract finance houses to operate in Vanuatu, it has proved necessary to employ fifty practicing accountants in Vila, the country's capital. Only three of these are natives of Vanuatu.

Although accounting graduates have a limited scope in which to work in the profession in the island communities, evidence from the profession also indicates that, for the foreseeable future, the level of knowledge required for a number of accounting processes in the commercial sector will not be extensive. What will be needed is a significant number of people trained in accounting procedures/systems to the extent that they can operate the financial accounting cycle and the related internal control processes for small business. Training would incorporate significant practical experience to give such students exposure to the problems of establishing and maintaining accounting systems so that on completion of the training, the "accountant" has the knowledge and self-confidence needed to solve practice problems.

Accountants and executives will be needed at a more advanced level to guide and manage small enterprises. This will obviously require a clear understanding of how to use accounting information and an ability to discriminate between relevant and irrelevant

⁹ L. Lyons, M. White, and A. Naughton, "Accounting: A First World System in a Third World Society," *Journal of Pacific Studies* (1983), 291; and R. Juchau, "Accounting and the Island Economies," 582-89.

information, but it will not require some of the esoteric knowledge associated with degree-level study of accounting. For example, there will be little need for the study of the economics of capital budgeting because most locally controlled businesses operate with minimal fixed assets and face limited markets. What is necessary, however, is an understanding of how community values will influence business goals and how accounting information can be brought to bear to help attain these goals. Thus, a village cooperative that places a high priority on break-even operations, employment, and customer services to the local community will benefit from knowing how much of its resources can be directed to such activities without jeopardizing its financial survival. More important than a high degree of expertise in advanced accounting techniques is the executives' ability to understand local value systems. This may require some education in cultural values for expatriate executives. The Pacific islander executive has an advantage here provided he or she can make satisfactory personal accommodations with the cultural "conflict" situations.

A role for accounting advisers also exists within these communities. Such "accounting advisers" must be aware of local sources of finance and other specialist financial expertise so that ventures that require new equity and debt financing can be appropriately guided and funded. The national development banks operating in these island groups already offer financial advisory services, but these are usually of a restricted nature and are confined largely to the main clients of the bank. This role could, however, be expanded to smaller enterprises as a legitimate diversification of a development bank's activity. Through the national development bank, the registrars of cooperatives and similar agencies might usefully employ "accounting advisers."

AN EDUCATIONAL RESPONSE AND SOME DANGERS

The University offers certificate and diploma programs in accounting designed to prepare students for the roles enumerated here. The certificate program contains three vocationally oriented course units and two course units of the first year of the degree program. Students can augment this by taking three additional vocational units and two second-year degree units for the diploma. The curriculum framework is outlined in Exhibit 5.

As implied by their largely vocational curricula, these subdegree programs have been designed for students committed to a career in accounting who, because of their limited formal educational

Exhibit 5. Certificate/Diploma Structure — USP

| Subject | Program | |
|--|---------------------------|-----------------------|
| | Certificate in accounting | Diploma in accounting |
| Basic Administrative Techniques | X | X |
| Project Planning | X | X |
| Social Survey Method and Data Analysis | X | X |
| Advanced Administrative Techniques | | X |
| Personnel Management | | X |
| Change and Development | | X |
| Accounting Information: Fundamentals | X | X |
| Accounting Information: Applications | X | X |
| Managerial Accounting | | X |
| Financial and Corporate Accounting | | X |

background, or because of heavy personal commitment to their family or local community, would not undertake a full degree program. A number of mature students, studying the sub-degree programs through USP, with a limited secondary school education but by dint of service, have risen to responsible positions in the civil service. Without securing any further qualification, these individuals have limited promotion prospects. They may study part-time through the university's continuing education program.

This form of curriculum design has two difficulties. The programs were designed considering student aspirations, abilities, and circumstances, but without first defining the society's accounting requirements. Student background data were the best source of information available at the time of establishing these programs. Some countries, notably Tuvalu and Vanuatu, have recently indicated their prime need for trained personnel in accounting to be at the technical level, but they have not defined the accounting services to be provided to the community. Put simply, the type of accounting information systems that should be produced to provide

relevant information to a village cooperative, for example, as opposed to a First World-based multinational corporation, has not yet been specified.¹⁰ The accounting systems currently available are those inherited from the colonial period and focus primarily on the stewardship function to the virtual exclusion of all else. Providing courses to train people to operate such a system is hardly likely to produce information suitable for the majority of decisions in the context of the island cultures. This is an area that must be thoroughly researched before relevant and effective curricula can be developed.

In such situations where some uncertainty as to curriculum direction exists and for reasons of economy, it is understandable that the certificate and diploma programs at USP draw course units from the degree, rather than provide all units especially designed to meet the needs of a sub-degree program. For example, the diploma program includes a course from the degree program in financial and corporate accounting although the corporate sector in some of the island states is virtually non-existent. On the other hand, no provision for the study of government accounting, local or national, which is common to all island states regardless of size, has been made.

Again, owing to resource limitations at the university, only seven of the ten degree course units can currently be taken in part-time programs, although it is possible to complete a certificate course in this way. This effectively limits the availability of the diploma qualification to full-time students and part-time students living in Suva where the university's main campus is located. These latter students already have access to the diploma in business studies offered by FIT. The university is producing diplomates in accounting studies at this stage of development largely by duplicating a service already available.

Given Fiji's position as the largest and the dominant state in the island groups served by USP, the accounting programs probably inevitably evolved as they did. As a regional institution, USP is in a unique position in tertiary education among the South Pacific Island states. The history of accounting education at USP shows, however, that educational agencies in the Third World will need to operate with imagination and sensitivity if they are to provide programs appropriate to those societies that complement the other positive social and economic development forces. Special attention to the appropriateness and scope of sub-degree programs is re-

¹⁰ See Lyons, White, and Naughton, "Accounting: A First World System," 291.

quired where economies have restricted commercial and industrial bases.

USP appears to be shifting from small island interests in accounting education. A proposal to add a professional year of study to the accounting degree program for those who aspire to membership in FIA may further drain the tertiary education resource. Such a provision will enable FIA to align its requirements with those of the professional bodies in Australia, thereby improving the quality and regulating the quantity of graduates entering the profession in Fiji. At the same time, this will permit graduates who do not proceed to the fourth year of study to seek careers in banking, commerce, and government. Since most Fiji nationals with an accounting major prefer a career in professional practice, the skilled accounting manpower has concentrated in this area at the expense of the necessary development in other sectors of Fiji's economy. To meet this need, a grave possibility exists, however, that resources will also be shifted from meeting the curriculum needs of other states served by USP. Serious socioeconomic and even political consequences could develop if such a shift persisted in the long term.

SUMMARY

Parker's model identified a number of the factors that influence a developing country's accounting practices. To an extent, these factors are predetermined (e.g., colonial influences) and, to an extent, the cultural variables set the context for appropriate development. Other elements within the model are affected by the way in which these factors impinge upon the development of accounting. It is necessary for professional bodies and educational establishments to resist undertaking roles that imitate those adopted in the First World and to concentrate on roles which positively encourage accounting practices suited to Third World conditions. The situation in the Southwest Pacific should not necessarily be regarded as unique; it serves to highlight problems faced elsewhere by small economies in the Third World. Providing accounting education appropriate to the needs of the scattered island communities of the South Pacific means that studies at the sub-degree level, meeting the scale needs of these small states, is paramount. The need for continuing education programs is apparent. The total population of the area is little more than 1.3 million in a region covering an area approaching 30 million square kilometers. The costs involved in leaving home and employment in a location

at the periphery of the region to attend a centrally located institution of higher education are prohibitive.

Educational resources must be used with sensitivity and economy.¹¹ Universities in the Third World must be prepared to operate with more flexibility than their First World counterparts, perhaps accepting curriculum appropriately modified from the non-university sector in the First World without forfeiting their status as centers of academic excellence.

¹¹ For current statistical data outlining educational resource difficulties for accounting manpower development, see Asian Development Bank, *Survey of Accounting Development and Accounting Education in Twenty-Five Countries of the Conference Region* (Asian and Pacific Conference on Accounting Education for Development, Manila, November 1984).

Standardization in Accounting Practices: A Comparative International Study

FOUAD AINAJJAR*

Several attempts to classify countries into groups according to their accounting practices have been attempted.¹ Nobes attempted a new method of international classification in 1983. This approach emphasized the underlying causal factors and followed the biologists' method. Nobes argued:

When classifying plants or animals biologists largely ignore the most obvious characteristics. That is, they do not carry out factor analysis on animals by weight, color, number of legs, nature of body covering, length of life. . . . In fact, by concentrating on a subjective model which involved underlying (but less obvious) characteristics . . . it is then found that behavior, intelligence, reproduction and ancestry begin to fit with the

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¹ For example, H. R. Hatfield, "Some Variations in Accounting Practices in England, France, Germany, and the US," *Journal of Accounting Research* (Autumn 1966); Gerhard G. Mueller, *International Accounting* (New York: Macmillan, 1967); R. H. Parker, "Britain into Europe: Some Accounting Consequences" (Paper presented at AUTA National Conference, Manchester, England, 1972); Adolf J. H. Enthoven, *Accounting and Economic Development Policy* (Amsterdam: North Holland, 1973), and *Accounting Systems in Third World Economies* (Amsterdam: North Holland, 1977); Richard C. da Costa, Jacques C. Bourgeois, and William M. Lawson, "A Classification of International Financial Accounting Practices," *International Journal of Accounting* (Spring 1978); Werner G. Frank, "An Empirical Analysis of International Accounting Principles," *Journal of Accounting Research* (Autumn 1979); R. D. Nair and W. G. Frank, "The Impact of Disclosure and Measurement Practices on International Accounting Classification," *Accounting Review* (July 1980); and P. S. Goodrich, "A Typology of International Accounting Principles and Policies," *AUTA Review* (1982).

classification. The biological scientists, then, use a classification which is evolutionary and concentrates on underlying fundamental variables.²

Many researchers have discussed the purpose of classification. Briefly, classification according to accounting practices was described in the 1977 study of the American Accounting Association as a fundamental step in an organized and scientific study of a population and as a method to "sharpen description and analysis." Other researchers describe it as an attempt to reveal underlying structures and to predict the behavior of a member of the population and as a tool to assist in the analysis of the need for, means toward, and progress in harmonization. Finally, for developing countries, classification is a means to find appropriate solutions for accounting problems.

This article examines a proposed classification of countries by degree of standardization in accounting. Exhibit 1 may serve as a hypothetical classification based on the evolution of standardization of practices and the environmental factors relating to the countries examined.

To test the hypothetical classification, a set of differentiation elements, including underlying (causal) characteristics and standardization practices, was selected. Each country was rated on these factors, and the results were used to see whether the classification plan outlined in Exhibit 1 could be supported. Another hypothesis is tested later in the paper.

The purpose here is to focus on one particular feature of accounting that can be compared internationally. The author believes that this feature, standardization, may be sufficiently central to international differences that a classification based on it may represent a useful description of how countries' accounting systems are related.

CONSTRUCTION OF A MORPHOLOGY

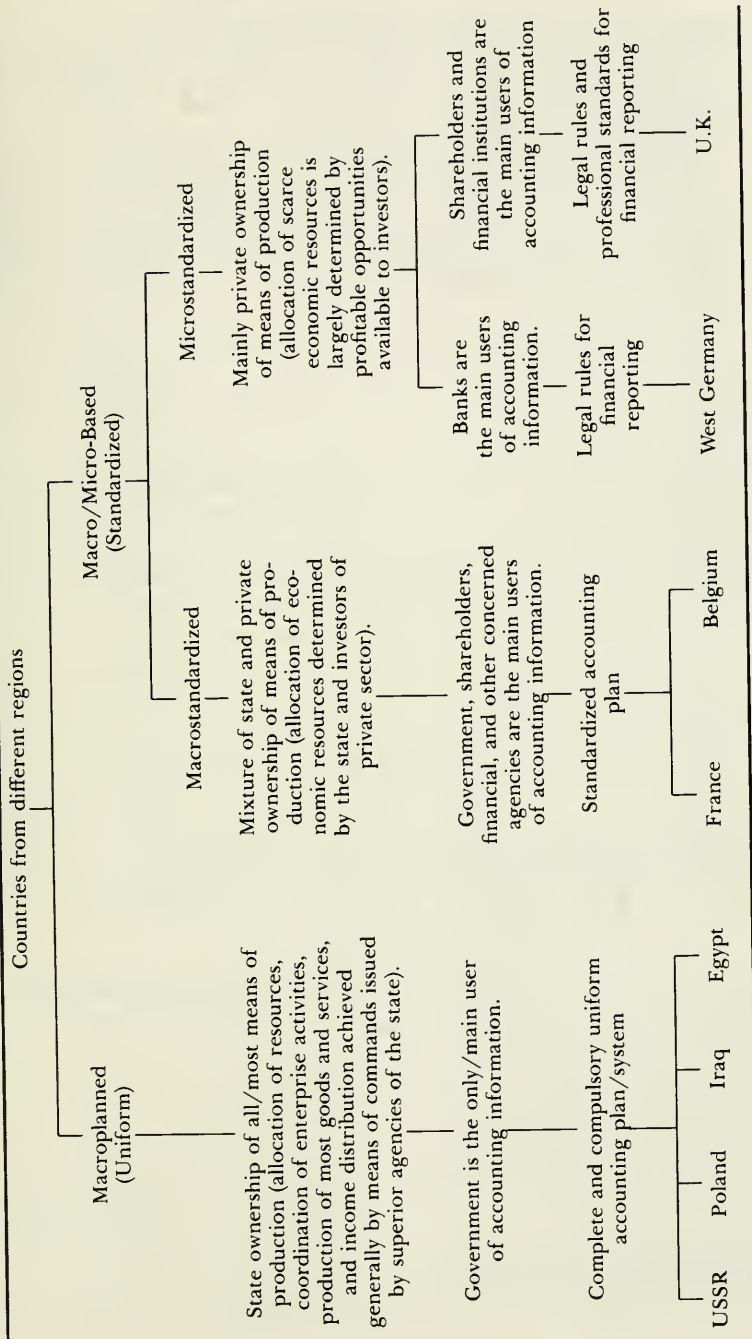
Selecting the Elements

This section attempts to identify underlying causal factors as well as the crucial elements of standardization. The former relates to the environment and economic and political systems that may have led particular countries to adopt certain degrees of standardization. An attempt is made to establish causation.

The countries chosen range from the USSR, which has a command communist system where all means of production are

² C. W. Nobes, "A Judgmental International Classification of Financial Reporting Practices," *Journal of Business Finance and Accounting* (Spring 1983), 4-5.

Exhibit 1. Classification of Standardization Practices of Selected Countries from Different Regions of the World



publicly owned, to the United Kingdom, where private-sector enterprises play a major role in leading the economy. Other countries, including two developing countries (Egypt and Iraq), are classified between these extremes.

Enthoven distinguished among three branches of accounting: enterprise accounting, government accounting, and social accounting.³ To produce a sensible classification, all branches of accounting cannot be included. Therefore, only the accounting of large commercial and industrial enterprises is considered here. Other branches will require a separate study.

Possible causal factors are identified in Exhibit 2 (factors 1–5). The standardization elements are also listed in Exhibit 2 (elements 6–16). The particular eleven standardization measures have been chosen, after a study of the existing accounting systems in the selected countries, to identify the differences noted. That the list is exhaustive or that somewhat different lists might not be selected by other researchers is not suggested. As with classification of biologists and chemists, judgment must eventually be used to establish the criteria for differentiation. The classifications selected by the author are open to inspection and rebuttal.

The author's method of classification is unlike those employed by Hatfield, Mueller, Enthoven, and Parker, where the technique of classification was not available for inspection and was thus difficult to verify or replicate later.⁴ Furthermore, the author's classification is also unlike those used by da Costa, Frank, Nair and Frank, and Goodrich;⁵ those classifications ignored the underlying environmental factors and were based on a mass of data (some of them apparently superficial and inaccurate), and some were not collected for classification purposes.⁶

Four separate analytical approaches have been performed. First, only the standardization elements 6–16 have been analyzed. Second, all elements 1–16 are used to determine the influence of the causal factors (1–5) on the results.

³ Enthoven, *Accounting and Economic Development Policy and Accounting Systems in Third World Economies*.

⁴ Hatfield, "Accounting Practices"; Mueller, *International Accounting*; and Parker, "Britain into Europe."

⁵ da Costa, Bourgeois, and Lawson, "A Classification of International Financial Accounting Practices"; Frank, "Analysis of International Accounting Principles"; Nair and Frank, "International Accounting Classification"; and Goodrich, "International Accounting Principles."

⁶ C. W. Nobes, "An Empirical Analysis of International Accounting Principles: A Comment," *Journal of Accounting Research* (Spring 1981).

Exhibit 2. Elements for Differentiation

| Element number and abbreviation | Element name |
|---------------------------------|---|
| Causal factors | |
| 1 (Econ) | Nature of economic system/extent of national planning |
| 2 (Fina) | Provider of finance/user of accounting information |
| 3 (Tax) | Importance of tax and other rules in measurement |
| 4 (Prof) | Importance of accountancy profession |
| 5 (Sett) | Responsibility for setting and implementing standards |
| Standardization elements | |
| 6 (Docu) | Primary documentation (e.g., their content, format, circulation) |
| 7 (Entr) | Entries of accounting transactions into the accounting records |
| 8 (Reco) | Accounting records, their content and format (e.g., ledgers, journals, subsidiary ledgers) |
| 9 (Defi) | Definitions of accounting terms |
| 10 (Code) | Code of accounts (national), also called chart of accounts (where accounts are classified into groups, subgroups and further subgroups) |
| 11 (H.C.) | Application of the historical cost convention (valuation of assets) |
| 12 (Dept) | Rules for allocating and calculating depreciation |
| 13 (Conv) | Conservatism/prudence in valuing buildings, stocks, debtors |
| 14 (Cons) | Consistency in applying the same rules from year to year despite the financial results of the year |
| 15 (Year) | Financial year end |
| 16 (F/S) | Content and format of the conventional financial statements (balance sheet, profit and loss account/income statement and notes to the accounts) |

Scoring Each Country Using the Elements

The information for scoring each country has been taken from several sources: literature review, two questionnaires, personal interviews, visits to the Western developed countries selected for the study, conference attendance, and meetings with accountants from the countries involved, as well as studying financial reports.⁷ The basis of scoring is described in Exhibit 3, which lists the scores for each country.

⁷ Details are available from the author. The main questionnaire was sent to academics of the countries studied in February 1984. With some modifications, it was also the basis for discussions during personal interviews conducted by the author during March and April 1984.

Exhibit 3. Morphology Based on Exhibit 2

| Elements of differen- tiation | 5 | 4 | 3 | 2 | 1 |
|-------------------------------------|---|---|---|--------------------|---|
| 1 ECON | Centrally planned economy | | | | Free market economy |
| 2 FINA | Government only | | Govt. to some extent | Mainly by Banks | Mainly by shareholders |
| 3 TAX | Strong influence | | | | Little influence |
| 4 PROF | Little influence (small, under- developed) | | | | Strong influence (old, large) |
| 5 SETT | Government legislation (law only) | | | | Mixture of laws and accounting profession standards |
| 6 DOCU | Specified instructions prescribed by law or accounting profession | | Some instructions prescribed to give general guidance | | Not prescribed |
| 7 ENTR | See 6 DOCU. | | See 6 DOCU. | | See 6 DOCU. |
| 8 RECO | See 6 DOCU. | | See 6 DOCU. | | See 6 DOCU. |
| 9 DEF1 | All terms defined by law or accounting | | | | Many defined by law or accounting profession |

The scale of 1 to 5 in Exhibit 3 was chosen because a broader scale would have implied an ability to discriminate more precisely than seemed possible to the author.

The "direction" of scoring the elements could be changed; for example, element 6 (Exhibit 3) could have specified instructions prescribed by law with a score of 1. This potential problem has been overcome by using various analytical approaches, such as intercountry differences rather than raw scores.

Another point to consider is the appropriate weight of the assigned elements. In all previous studies, the elements were assigned equal weight because no weighting method was considered appropriate. The present weighting procedure is used for the first and second analyses, then the analysis is repeated with the standardization elements (6-16), and finally all the elements are assigned unequal weights, as described later, to test for sensitivity.

A final point connected with the weighting problem is the

Exhibit 3. Morphology Based on Exhibit 2 (continued)

| Elements of differentiation | 5 | 4 | 3 | 2 | 1 |
|-----------------------------|---|---|---|---|--|
| 10 CODE | Required by law of accounting profession | | | | Not generally found in practice |
| 11 H.C. | Strictly required by law or accounting profession | | | | Prescribed to give general guidance |
| 12 DEPT | Strictly required by law or accounting profession | | | | Prescribed to give general guidance |
| 13 CONV | Strong degree of conservatism in practice | | | | Prescribed to give general guidance |
| 14 CONS | Strong degree of consistency in practice | | | | Prescribed to give general guidance |
| 15 YEAR | Required by law or accounting profession | | | | Commonly found in practice |
| 16 F/S | Required by law or accounting profession | | | | Prescribed minimum content and classification (multiple choices) |

potential for adding different elements as though they were measured in the same plane. All previous research attempts shared this problem. However, the differences on scores are sufficiently clear that this may not be seen as a problem. See the totaling differences, page 169 and Exhibit 8.

ANALYSIS

To test the classification of Exhibit 1, the data in Exhibit 4 must be analyzed. Several analytic approaches are described here.

Totaling

A serious conceptual problem exists from the addition of scores on different factors (much as adding cash to historical cost-fixed assets in a balance sheet!). Having used judgment to attempt to align all the factors in the same direction, however, the author could score the totals so that the results could be reviewed (Exhibit 5). This exhibit reveals that the first group has the highest scores, ranging between 51 and 55. These countries are strongly related

Exhibit 4. Scoring Based on Exhibit 3

| | Belgium | Egypt | France | Germany | Iraq | Poland | United Kingdom | USSR |
|------|---------|-------|--------|---------|------|--------|----------------|------|
| ECON | 2 | 4 | 3 | 1 | 4 | 5 | 1 | 5 |
| FINA | 3 | 4 | 4 | 2 | 5 | 5 | 1 | 5 |
| TAX | 4 | 5 | 4 | 5 | 5 | 5 | 2 | 5 |
| PROF | 4 | 5 | 4 | 4 | 5 | 5 | 1 | 5 |
| SETT | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| DOCU | 3 | 4 | 4 | 1 | 4 | 5 | 1 | 5 |
| ENTR | 3 | 3 | 3 | 1 | 4 | 5 | 1 | 5 |
| RECO | 3 | 5 | 4 | 1 | 5 | 4 | 1 | 5 |
| DEFI | 4 | 5 | 5 | 3 | 5 | 5 | 2 | 5 |
| CODE | 5 | 5 | 5 | 2 | 5 | 5 | 1 | 5 |
| H.C. | 4 | 5 | 4 | 5 | 5 | 5 | 3 | 5 |
| DEPT | 4 | 4 | 4 | 4 | 4 | 5 | 2 | 5 |
| CONV | 3 | 5 | 3 | 4 | 5 | 5 | 2 | 5 |
| CONS | 4 | 5 | 4 | 3 | 5 | 5 | 4 | 5 |
| YEAR | 4 | 5 | 4 | 3 | 5 | 5 | 3 | 5 |
| F/S | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |

Exhibit 5. Totals from Exhibit 4

| Country | Standardization elements | Causal factors | Total |
|----------------|--------------------------|----------------|-------|
| USSR | 55 | 25 | 80 |
| Poland | 54 | 25 | 79 |
| Iraq | 52 | 24 | 76 |
| Egypt | 51 | 23 | 74 |
| France | 45 | 20 | 65 |
| Belgium | 42 | 18 | 60 |
| West Germany | 32 | 17 | 49 |
| United Kingdom | 23 | 8 | 31 |

and correspond to the "macrouniform" group of Exhibit 1. The second group has lower scores ranging between 42 and 45 and corresponds to the "macrostandardized" group. The countries with the lowest scores correspond to the "microstandardized" group. The countries of this last group are not so strongly related as those in the first and second groups.

The same procedure was applied to the causal factors. The result (reported in the last two columns of Exhibit 5) shows a similar division.

To test for sensitivity, two further analyses, assigning unequal weights (as presented in Exhibit 6) for elements 6-16 and then

**Exhibit 6. Scoring Based on Exhibit 4
(weighted scores)**

| Elements | wt. | Belgium | Egypt | France | Germany | Iraq | Poland | United Kingdom | USSR |
|----------|-----|---------|-------|--------|---------|------|--------|----------------|------|
| 1 ECON | 7 | 14 | 28 | 21 | 7 | 28 | 35 | 7 | 35 |
| 2 FINA | 5 | 15 | 20 | 20 | 10 | 25 | 25 | 5 | 25 |
| 3 TAX | 4 | 16 | 20 | 16 | 20 | 20 | 20 | 8 | 20 |
| 4 PROF | 3 | 12 | 15 | 12 | 12 | 15 | 15 | 3 | 15 |
| 5 SETT | 4 | 20 | 20 | 20 | 20 | 20 | 20 | 12 | 20 |
| 6 DOCU | 2 | 6 | 8 | 8 | 2 | 8 | 10 | 2 | 10 |
| 7 ENTR | 1 | 3 | 3 | 3 | 1 | 4 | 5 | 1 | 5 |
| 8 RECO | 2 | 6 | 10 | 8 | 2 | 10 | 8 | 2 | 10 |
| 9 DEFI | 2 | 8 | 10 | 10 | 6 | 10 | 10 | 4 | 10 |
| 10 CODE | 4 | 20 | 20 | 20 | 8 | 20 | 20 | 4 | 20 |
| 11 H.C. | 2 | 8 | 10 | 8 | 10 | 10 | 10 | 6 | 10 |
| 12 DEPT | 2 | 8 | 8 | 8 | 8 | 8 | 10 | 4 | 10 |
| 13 CONV | 2 | 6 | 10 | 6 | 8 | 10 | 10 | 4 | 10 |
| 14 CONS | 2 | 8 | 10 | 8 | 6 | 10 | 10 | 8 | 10 |
| 15 YEAR | 1 | 4 | 5 | 4 | 3 | 5 | 5 | 3 | 5 |
| 16 F/S | 4 | 20 | 20 | 20 | 20 | 20 | 20 | 12 | 20 |

**Exhibit 7. Totals from Exhibit 6
(weighted scores)**

| Country | Standardization elements | Causal factors | Total |
|----------------|--------------------------|----------------|-------|
| USSR | 120 | 115 | 235 |
| Poland | 118 | 115 | 233 |
| Iraq | 115 | 108 | 223 |
| Egypt | 114 | 103 | 217 |
| France | 103 | 89 | 192 |
| Belgium | 97 | 77 | 174 |
| West Germany | 74 | 69 | 143 |
| United Kingdom | 50 | 35 | 85 |

for all the elements, were conducted. The results in Exhibit 7 were similar to those in Exhibit 5. Having established that the environmental factors have no significant influence on the results, the other analyses noted here used the *standardization elements only* (elements 6–16).

Totaling Differences

The next approach was to calculate intercountry differences. For instance, the scores in Exhibit 4 can be used to find the difference between the scores of Belgium and Egypt on element 6, and this can be added to the difference on element 7, and so on. The

results would yield a matrix of total differences for the countries (Exhibit 8). The total difference in scores for Belgium and Egypt is "9"; the lowest difference, "3," is between Belgium and France. This difference reflects the similarity of standardization practice between the latter two countries.

An examination of Exhibit 8 allows an attempt for classification as in Exhibit 5. Once again, the simple classification which results seems to correlate with Exhibit 1.

Computer Analysis

The computer program used was CLUSTAN PACKAGE (clustering). It calculates coefficients between (in this case) countries and presents the results in a matrix form and in an order for nearest neighbors, hierarchy, and tree. The program also calculates coefficients for similarities, distances, size differences, shape differences, and farthest neighbor.⁸

The data used are those in Exhibit 4. A similar approach totaling differences was first attempted. This time the coefficients between the countries were calculated. The results are reported in Exhibit 9 and are similar to those of Exhibit 5. The coefficient between the first country, Belgium, and the country next to it, Egypt, is 1.182, and the lowest coefficient is for France, 0.273. This means that France is the country most like Belgium. This process is continued for each country.

A further analysis was made by focusing on one country at a time using the coefficients between the countries. This approach attempts to identify the nearest neighbor followed by the next nearest neighbor, and so on. The results are reported in Exhibit 10. For example, the country nearest Iraq is Egypt, with a coefficient

Exhibit 8. Matrix of Total Differences between Countries

| | Belgium | Egypt | France | Germany | Iraq | Poland | United Kingdom | USSR |
|----------------|---------|-------|--------|---------|------|--------|----------------|------|
| Belgium | 0 | | | | | | | |
| Egypt | 9 | 0 | | | | | | |
| France | 3 | 6 | 0 | | | | | |
| Germany | 10 | 19 | 13 | 0 | | | | |
| Iraq | 10 | 1 | 7 | 20 | 0 | | | |
| Poland | 12 | 3 | 9 | 22 | 2 | 0 | | |
| United Kingdom | 19 | 28 | 22 | 9 | 29 | 31 | 0 | |
| USSR | 13 | 4 | 10 | 23 | 3 | 1 | 32 | 0 |

⁸ For details, see D. Wishart, *CLUSTAN-Computer Package*, 3rd ed. (Edinburgh: Edinburgh University, 1978), and *CLUSTAN Computer Package*, supplement to 3rd ed.

Exhibit 9. Coefficients between the Countries

| | Belgium | Egypt | France | Germany | Iraq | Poland | United Kingdom | USSR |
|----------|---------|-------|--------|---------|-------|--------|----------------|------|
| S 1 BEL | 0 | | | | | | | |
| S 2 EGP | 1.182 | | | | | | | |
| S 3 FRA | 0.273 | 0.727 | | | | | | |
| S 4 GER | 2.364 | 4.636 | 3.545 | | | | | |
| S 5 IRQ | 1.273 | 0.091 | 0.818 | 5.091 | | | | |
| S 6 POL | 1.636 | 0.636 | 1.182 | 5.818 | 0.364 | | | |
| S 7 UK | 3.909 | 7.273 | 5.273 | 1.727 | 7.727 | 8.818 | | |
| S 8 USSR | 1.909 | 0.545 | 1.273 | 6.455 | 0.273 | 0.091 | 9.455 | 0 |

of 0.091 (great similarity) followed by the USSR, with a coefficient of 0.273 (less similarity), and so on. By examining Exhibit 10, a classification similar to that of Exhibit 5 may be produced.

Clustering by Nearest Neighbor

This analysis is designed to produce clusters using the procedures "hierarchy" and "tree." This program identifies the two countries which are nearest each other (in this case, Egypt and Iraq, which are joined at the very low coefficient of 0.091). Thus, there are now seven clusters, Egypt and Iraq, plus six other clusters of one country each. Another set of two or more similar countries, in this case Poland and the USSR, are next classified. This process continues until all the countries are classified in one group. The researcher must use judgment as to where to stop. Exhibit 11 presents the results in a tree style and, despite the coefficient differences among the groupings, identifies four clusters: Belgium and France; Egypt, Iraq, Poland, and the USSR; Germany; and the United Kingdom. These correspond with those groups of Exhibit 1.

Clustering by Farthest Neighbor

A similar analysis can be made by using dissimilarities; in other words, by identifying the two countries with the greatest distance between them and so on. This approach produces four clusters and identifies the positions of the countries, as well as the distances between them.

An interesting point is that although four clear clusters exist, the distance between each of the countries in the first and second groups is very small. (See Exhibit 12.) This may be due to the fact that the standardization practices of the countries of these two groups are similar. Furthermore, although they are separated by a great distance, Germany and the United Kingdom constitute

Exhibit 10. Nearest Neighbors for Each Country

| Seven K-Linkage lists (nearest neighbors) | | | | | | | | | |
|---|------------|------------|-----------|-----------|------------|-----------|------------|--|--|
| S 1 Belgium | 0.273 FRA | 1.182 EGY | 1.273 IRQ | 1.636 POL | 1.909 USSR | 2.364 GER | 3.909 U.K. | | |
| S 2 Egypt | 0.091 IRQ | 0.545 USSR | 0.636 POL | 0.727 FRA | 1.182 BEL | 4.636 GER | 7.273 U.K. | | |
| S 3 France | 0.273 BEL | 0.727 EGY | 0.818 IRQ | 1.182 POL | 1.273 USSR | 3.545 GER | 5.273 U.K. | | |
| S 4 Germany | 1.727 U.K. | 2.364 BEL | 3.545 FRA | 4.636 EGY | 5.091 IRQ | 5.818 POL | 6.455 USSR | | |
| S 5 Iraq | 0.091 EGY | 0.273 USSR | 0.364 POL | 0.818 FRA | 1.273 BEL | 5.091 GER | 7.727 U.K. | | |
| S 6 Poland | 0.091 USSR | 0.364 IRQ | 0.636 EGY | 1.182 FRA | 1.636 BEL | 5.818 GER | 8.818 U.K. | | |
| S 7 United Kingdom | 1.727 GER | 3.909 BEL | 5.273 FRA | 7.273 EGY | 7.727 IRQ | 8.818 POL | 9.455 USSR | | |
| S 8 USSR | 0.091 POL | 0.273 IRQ | 0.545 EGY | 1.273 FRA | 1.909 BEL | 6.455 GER | 9.455 U.K. | | |

Exhibit 11. Tree Classification for the Examined Countries

| Items grouped | | | | | | | | | | | | | | | | | |
|---------------|---|---|-------|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|-----------------|---|
| Cycle | I | J | Coeff | BEL ¹ | | FRA ³ | | POL ⁶ | | EGP ² | | USR ⁸ | | GER ⁴ | | UK ⁷ | |
| | | | | | | | | | | | | | | | | | |
| | | | | * | | | | | | | | | | | | | * |
| 1 | 2 | 5 | 0.091 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 2 | 6 | 8 | 0.091 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 3 | 2 | 6 | 0.273 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 4 | 1 | 3 | 0.273 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 5 | 1 | 2 | 0.727 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 6 | 4 | 7 | 1.727 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| 7 | 1 | 4 | 2.364 | * | : | : | : | : | : | : | : | : | : | : | : | : | * |
| | | | | * | | | | | | | | | | | | | * |
| | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |

individual clusters with great distance also between each of them and the first and second groups.

However, unlike the United Kingdom, Germany is closer to the French/Belgian cluster (see Exhibit 12). This is quite obvious because rigid accounting rules for financial reporting are enforced in Germany. Nevertheless, compared to ten years ago, the United Kingdom has moved closer toward Germany.⁹

TESTING AN ADDITIONAL HYPOTHESIS

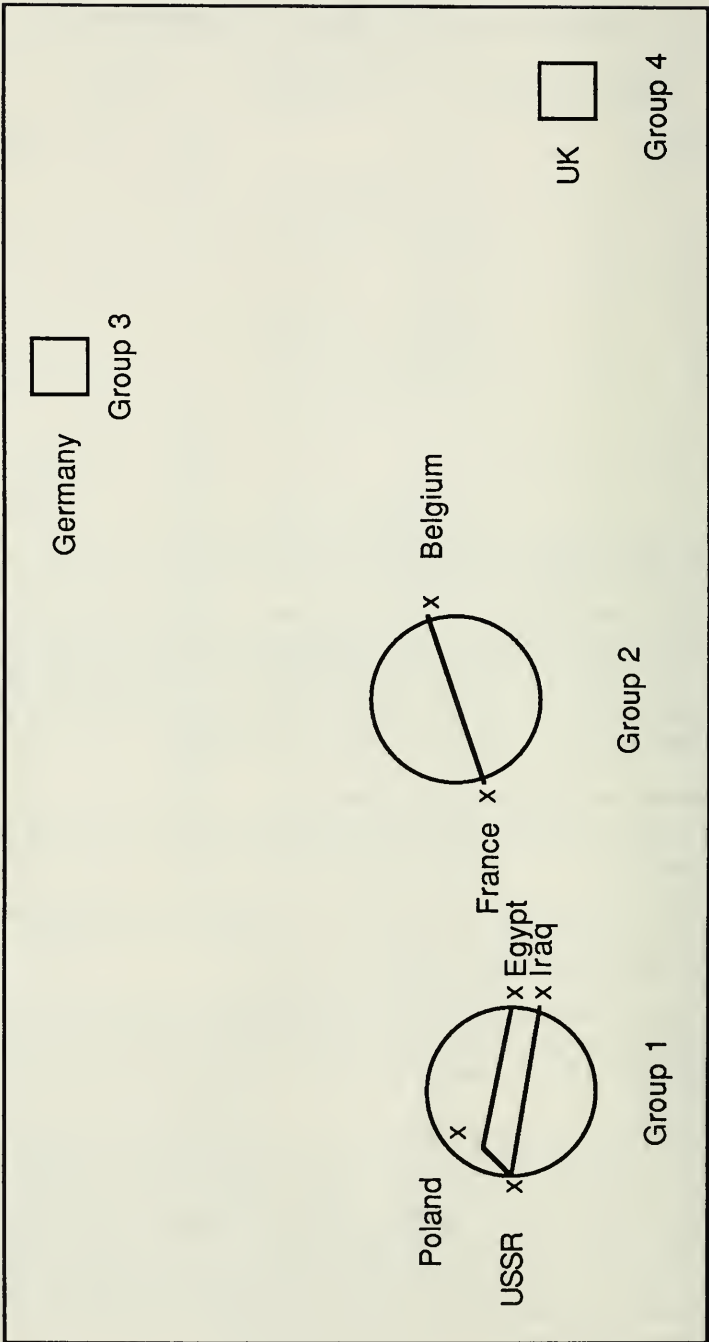
The final hypothesis to be discussed briefly and to be tested is the following:

Internationally, there is a tendency toward more standardization, and governmental jurisdiction over accounting standards is increasing and becoming predominant over time.

To test this, the development of standardization practices of the specified countries between 1970 to 1985/86 was examined and studied carefully. Some argue that "accounting, as product of its

⁹ The standardization practices have not been changed greatly in Germany, but serious accounting events took place during this period (1970–1985/86) in the United Kingdom. The Accounting Standards Committee was established, and more than twenty statements of standard accounting practice (SSAPs) were introduced and have become binding. More importantly, the recent legislation of the Companies Act of 1980 and 1981 has prescribed the content and format of financial statements, as well as valuation rules. This latest event has influenced the degree of standardization in the United Kingdom (through the European Economic Committee's Fourth Directive, which has introduced German rules) and led the United Kingdom to move toward Germany.

Exhibit 12. Distances between the Countries of Each Cluster



economic environment, has constantly changed to meet requirements of commerce, industry, government. . . ."¹⁰ Thus, investigation also focuses on the changes in the underlying environmental factors. The results are also based on the scoring of Exhibit 4. With the exception of the USSR and Egypt, during this period the remaining countries either have witnessed dramatic changes in their accounting practices, as in Belgium, Iraq, and the United Kingdom, or they experienced some changes, as in Poland, France, and Germany.

Poland, a communist country with significant influence from the USSR, has moved since 1976 toward more standardization with the introduction of a national uniform accounting plan. Iraq, a developing country with a centrally planned economy, witnessed dramatic changes with the introduction of a series of uniform systems from 1970 until the enforcement of a new uniform national system in 1982. This has moved Iraq significantly toward greater standardization. This development has resulted from government involvement in leading the economy. Belgium has been particularly influenced by France and the directives of the European Economic Community. In less than ten years, it has moved toward greater standardization and closer toward the French position.

The United Kingdom is now practicing a relatively high degree of standardization and it will likely experience more standardization in the future. Thus far, standardization has mainly affected report formats. Company law still has few details as to measurements, and accounting standards do not have the force of law but are professionally binding on auditors. However, legal backing for accounting standards has been proposed recently.¹¹

Countries which have not witnessed major changes since 1970 experienced them earlier. For instance, in 1965, the German Corporation Law was introduced with prescribed formats for financial reporting and many new disclosure requirements¹²; in 1966, an Egyptian uniform national system was enacted and became effective with the 1967 financial year. In the USSR, a more

¹⁰ Enthoven, *Accounting and Economic Development Policy*, 6.

¹¹ For details, see L. C. B. Gower, "Review of Investor Protection." (Report to the British Parliament, January 1984); I. H. Davidson, "Leadership and Consultation — The Path for ASC," *Accounting* (March 1984); and M. Bromwich, "Accounting Standard Setting: Can Self-Regulation Survive?" (Paper presented at Strathclyde University, Glasgow, Scotland, 1985).

¹² For details, see R. Mueller and E. Galbraith, *The German Corporation Law* (Frankfurt: Fritz Knapp Varley, 1966).

comprehensive uniform accounting plan was introduced in 1969 in response to the economic reforms of 1966.

The conclusion of this study is that national accounting practice has gradually come under more government legislation and control regardless of the particular existing national economic and political systems.

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¹ William A. Dymsza, Multinational Business Strategy (New York: McGraw-Hill, 1972), 49-53.

² Geoffrey Holmes, "Replacement Value Accounting," Accountancy (March 1972), 4-8.

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